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THE ARCHITECTURAL FORUM

VOLUME XXXI

NUMBER 5

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VIEW LOOKING NORTH ON
BROADWAY, NEW YORK CITY
Lower Stories of Woolworth Building
At Left and Old Post Office at Right
Photograph by John Wallace Gillies

THE ARCHITECTURAL FORUM FOR QUARTER CENTURY THE BRICKBUILDER

VOLUME XXXI

NOVEMBER 1919

NUMBER 5

✓ The Apartment Building for Moderate Rentals

By ELISHA HARRIS JANES

IN discussing the conditions of moderate priced apartments it is necessary to consider somewhat the origin and development of the type, and the best place to trace their growth is in New York, where they started, and where at all times the housing problem is the most serious and conditions the most changeable.

Curiously, although the first one built in New York was designed by one of our most eminent architects, the late R. M. Hunt, in 1869, very few of the thousands erected since have been from the plans of a prominent architect.

The first apartment caused much ridicule, directed not at the architect but at the idea of the owner. The building was erected on a wide plot; a few others followed and, as their practicableness began to be demonstrated the ever ready speculator started to imitate, but not on a wide plot or with the assistance of the skilled architect, but on the narrow 25-foot city lot, and probably from his own plans. This resulted in the development of the long string of rooms, all except those at the front and back, dark and musty, and smelling of the lively little germs. Even if several lots were to be improved, the foresight of the speculator could not show him any advantages in changing the type of plan. The corner plot was the one exception.

These conditions existed up to the late '90's, for although this substitute for a dwelling was far from attractive, the narrow and elongated conditions of Manhattan Island encouraged the apartment house development. About this time the real estate operator expanded, introduced the building loan method, worked with larger plots, and encouraged building on units of 50 feet or thereabouts—all with more or less improvement and with the development of several types of plan.

In the meantime the real tenement house was paralleling the development of the apartment, only with such disgraceful results that the agitation for its betterment finally reached a climax, and, notwithstanding the strong oppositions and the many arguments advanced to show that every one interested in apartments or tenements would

be ruined, there was passed by the New York Legislature a law which was the greatest blessing to the health of the people, the housing problem in New York, and to real estate in general—the Tenement House Law—a law that has been used as the foundation for most of the laws covering ventilation and housing in many other cities and states.

How did it work out? For about two years no builder was found bold enough to risk sinking his money in what he thought was doomed to failure, and few of this class of buildings were erected; but this was really fortunate for the speculating builder, as the supply had gotten ahead of the demand, and had building continued at the previous rate, it would have spelled ruin to many of them.

The squalid and wretched conditions of the people, doomed by their poverty to live in the old tenements, caused some philanthropic men to study model housing problems, experimenting practically by erecting buildings, and risking an investment to better the living conditions of the poor. These experiments proved such good financial investments that competent architects were invited to make a serious study of the subject, and competitions produced many excellent plans which greatly improved the general housing conditions and proved the new law a success.

With the high priced apartment so much capital is involved that the builder fears to risk it with other than an experienced architect, and many are the splendid plans which have been evolved for these buildings.

Much has been published of these two classes,—the tenement house and the high priced apartment,—but of the moderate priced apartment, built to rent from \$7 to \$30 per room per month, no one has appeared to champion its humble but necessary cause, and upon it very little serious thought has been bestowed. Nevertheless, in many ways, this problem is much more difficult than either of the others. In the expensive apartment such high rentals can be obtained there is little excuse for not giving the tenant all that he desires or expects. In the tenement not much is expected in the way

of luxuries — often they do not get even hot water or heat. But with the moderate priced apartments the tenants look for almost as much as the high priced apartments give, and expect to pay little more than do the occupants of the tenement houses. As an example, many of the tenements rent as high as \$8 per room, and the people have only painted walls, sometimes a fresh coat when a new tenant moves in, or perhaps the walls are just washed. Some moderate priced apartments up to this year rented for but little more, yet each new tenant expected new wall paper on every room, decorated halls, telephone in the house, janitor service, and so on with many other items.

It is to be regretted that, with few exceptions, apartment houses are built by speculative builders who employ architects whose low fees are far more attractive than their workmanship, and who can therefore afford to give very little study to the problem, even if they had the ability. For a short time other cities suffered from the same trouble, and in Chicago sets of plans were even advertised at \$5 and up. This is the reason that New York, which should now lead in apartment house buildings, does so in *numbers* only but not in *quality*, except in the highest priced apartments. Almost every other city having apartments can show better planned and better paying buildings of the moderate priced class, and designed by the better class of architects. The main faults appear to lie in the method by which they are financed, designed and built in New York.

One asks, then, "Why, if these methods are so bad, the plans so poor and so little studied, are the buildings successful, and why does it pay to continue to build them?" It probably would not pay in any other city. But in New York the growth of population has been so rapid it has been safe to repeat previous plans, and the speculator sees no reason for changing his methods. The supply has continually been behind the demand, with the exception of 1899 just before the Tenement House Law went into effect, when the fever of erecting apartment houses with building loans had been running high for some time and a speculator could erect a building without any capital.

Therefore, when a new type of plan is suggested to the builder it is difficult to persuade him to adopt it. Some improvement in the plans is due to a building being erected by some investor who has engaged a competent architect to study the problem; but too often, while the architect may develop a good plan in many respects, he has not been able to give it the study required to produce the most economical one, which you cannot blame a speculator for wanting. The greatest improvements occur when a progressive builder has an

open mind and will listen to and engage one of the very few architects experienced in the work. Unfortunately this is rare and the arguments have to be long and strongly presented. But when the new idea has proved a success, the other speculators' architects are quick to copy.

The method by which most apartment houses are built and financed should be considered briefly. With few exceptions they are built for speculation, and while many of the builders are conscientious and erect well built buildings, many others are actuated with the single idea of negotiating an early sale, and "anything will do" is their motto.

Few of the builders can afford to use much of their money in the purchase of the site, so that most of the property used in apartment building is generally bought in large plots by real estate operators, either at auction sales or from estates. Sometimes it is accumulated from small plots. It is then subdivided and sold to the speculative builder, who purchases the plot with a purchase money mortgage, or a very generous mortgage, and arranges with either the operator or an institution for a building loan, by means of which money is advanced as the building progresses, that may or may not become a permanent loan at the completion of the building. When this method first started a builder was able to undertake an operation without expending any money of his own at all, but from sad lessons building institutions and money lenders are now much more careful. Several of them retain architects (but charge the cost of the service to the builders), who pass upon the plans, specifications and construction methods, and issue certificates before any money is advanced upon the loans. They also have certain standards to which the building must comply. When an investor purchases a building erected by money loaned by one of these institutions, he may be satisfied that structurally he is getting a very good building.

With these few exceptions, beyond deciding the size of the plot to be built upon, few restrictions are made by the operators when the property is sold, resulting often in one building injuring the one adjoining. Here is where the operator could help in an advantageous development. If, instead of selling two or three lots and allowing the builder to erect any kind or shape of building, he would consider his whole plot, have it carefully studied and sold in such parcels that each would benefit the other, he would not only add to the comforts of the tenants, but would be repaid by the greater success of the building, and therefore, quicken sales of the balance of the plot.

It is well known that there is economy in large units, or a combination of many smaller ones oper-

ated as one large unit, by the saving in one heating plant, one superintendent, etc. Yet the market for the large plant is limited, so naturally the size that is the most marketable must be considered. Nevertheless, the fact that some small units are to be used, does not mean that the profit of light or ventilation in larger units by combining court space should be lost to the small units, and they would not be if the whole plot is first considered.

Recently there have been several cases where the whole plot was studied in mass and lots sold with restrictions as to the general court area affecting each building. Figure 1 shows a block diagram of how one plot was originally laid out for development, using one of the popular types of apartment—that with the open court in front; and Fig. 2, the change that was made after the owner was persuaded to

allow the whole block to be studied. For this plot sketches were submitted, using the different standard types of plan as shown in Fig. 3, the dumbbell plan, the type with *rear* courts only, and the open *front* court and its variations. An inspection of the block plans readily shows which gives the better ventilation and light. They both provide the same number of rooms per lot.

Figure 1 uses the minimum size courts and covers almost the maximum amount of ground allowed; while in Fig. 2 the combining of courts has allowed 20 feet between the buildings instead of the minimum of 13 feet, and the two yards amount to 32 feet instead of 26 feet as required, thus giving additional space for garden treatment. The staggering of the units allows the rear apartments to obtain a view to the street and to benefit from the breezes in any direction. Although the buildings cover a smaller percentage of area, they contain as many rooms as in the first arrangement, and therefore cost less per square foot of rental area to produce, as will be shown later in the article.

Figures 4 and 5 show two developments in walk up apartments which are great advances over the usual types. Each building profits by the court space of its neighbor and all benefit by good garden space, splendid ventilation and much

greater privacy. These also cover a much smaller percentage of the plot than the usual types and are consequently produced at a lower rate per renting foot.

The plot having been decided upon, the next thing to consider is the size of the apartments,—what number of rooms are most suitable to the neighborhood. This depends on many conditions

and is really a study to be made in consultation with the real estate professional; only he knows how many inquiries have been made for the different kinds of suites, the amounts that can be paid, and how [other buildings have succeeded. This decided, the type of building is discussed.

Is it to be a walk-up or an elevator apartment, and how many stories? The former is the more economical to build and maintain, but

when higher than four stories the difficulty arises of renting the upper apartments. Five stories is really the limit except in very cheap buildings. Some builders, in order to overcome the objections of the climb to the fifth floor, endeavor to make that apartment more attractive by small balconies and French windows, which also improve the

façade. The low building, especially when spread out like many of the Chicago and Boston apartments, gives much more the impression of a dwelling and is therefore very popular. The elevator apartment costs from \$1 to \$1.25 per month per room

more to operate, but allows many more apartments on the same piece of property. Can the class of tenants pay that additional amount? When entering upon an undeveloped field it has been considered hazardous to pioneer with an elevator apartment; on the other hand, if the walk-ups have been started and the elevator apartments make their appearance, the former are apt to suffer.

Having decided these questions and obtained the costs of the property and building, it is a matter of figures to check back and find the most profitable combination.

In planning the plot the first question the builder of apartments asks is, "How many rooms can you get on this plot?" his theory being that the plan

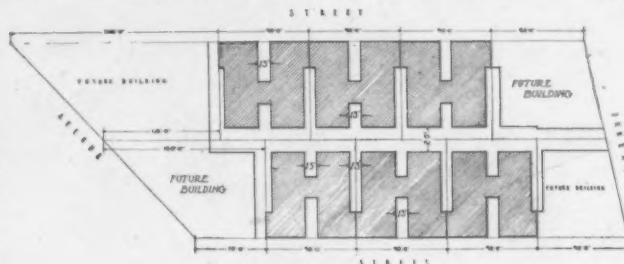


Fig. 1

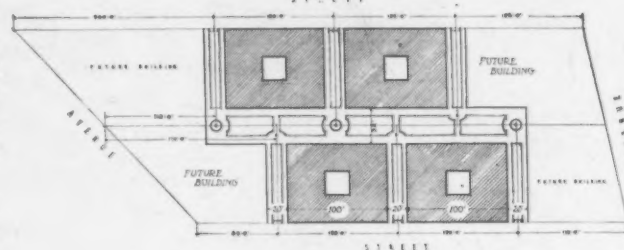


Fig. 2

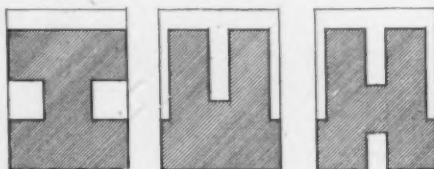


Fig. 3

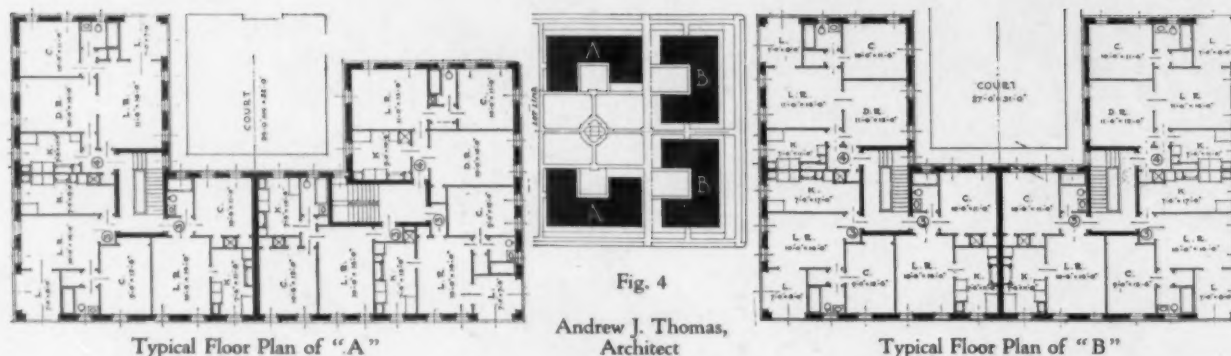


Fig. 4

Andrew J. Thomas,
Architect

with the greatest number of rooms on a given plot will give the greatest income. What a fallacy! Assuming for argument that the outlook of the rooms and the other conveniences are on a par in each case, unless the property is very high priced the reverse is apt to be the case.

The second fallacy is that the more apartments you serve with one flight of stairs or one elevator, the cheaper will be the operation and hence the better the income. This is wrong in practically all cases. Those points were shown to the owner in the plot plans (Figs. 1 and 2), when figuring out the investment. The best typical plans were taken; the value of outlook and environment were considered equal for the moment, and the buildings were compared on the basis of cost per square foot of rental space. In this the bathrooms, closets, etc., were not figured

in the rental space in the buildings, as they were of the same area in each plan and therefore constant, and the halls were omitted as the minimum is preferable, and it is furthermore in this part of the plan where most of the space is wasted.

Assume a price for a square foot of property and a price per square foot for the building. If this is divided by the rental space, there will be obtained a cost per square foot of rental space by which the costs of the operations can be compared.

The property was placed at \$7,500 a lot of 2,500 sq. ft., or \$3 per square foot, and the buildings, six stories high, at \$20 per square foot. Of the different types selected from those generally built covering the maximum of lot allowed and compared, the dumbbell plan (Fig. 6) showed the best results as follows:

Lot,	7,800 sq. ft. @ \$3	.....	\$23,400
Building,	5,560 sq. ft. @ \$20	.....	111,200
Cost	.....	.....	\$134,600

Divided by the area of rooms, 19,800 sq. ft. = \$6.79 as the cost per square foot of renting space.

The percentage of ground covered is 71.3, and only 59.3 per cent of the area of the building is devoted to rooms.

In the plan accepted (Fig. 7) the cost shows as follows:

Lot,	11,670 sq. ft. @ \$3	.....	\$35,010
Building,	7,350 sq. ft. @ \$20	.....	147,000
Cost	.....	.....	\$182,010

Divided by the area of rooms, 29,220 sq. ft. = \$6.23 as the cost per square foot of renting space.

Ground covered is 62 per cent, and 66.2 per cent of the building was used for rooms. This gives a

saving of 56 cents per renting foot, or 8.1 per cent on the cost of the building.

Applying the same test to the plans shown in Fig. 4 and Fig. 5,* practically the same results

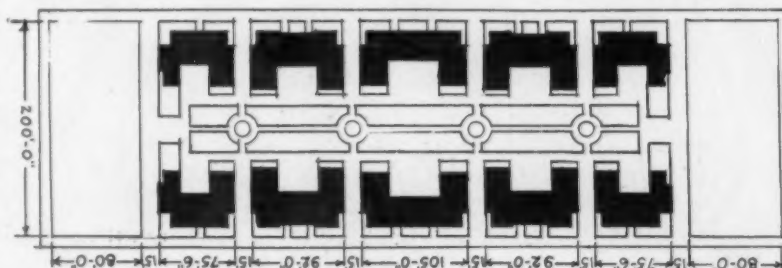


Fig. 5. Andrew J. Thomas, Architect

are obtained, showing that the building occupying the smaller percentage of ground may be the better investment, specially when part of a large unit.

Many groups of apartments have been built up by the smaller speculative builders who buy their property from the operator who often owns as large plots as these examples show. Would it not be better for the operator to establish some unit to work to, letting each builder have his individual minor changes if he desires, but plot buildings so that each may derive some benefit from the other?

In other cities, on account of very deep lots, some being 200 and 300 feet deep, the large open court is quite common, as is shown in the plans (Fig. 8 and Fig. 9), and it is to be noted that in neither plan does a stairway lead to more than two apartments on a floor.

We now come to the question of determining the number of stairways or elevators. As soon as

*Detailed plans and description of this group of apartments were published in *THE FORUM*, June, 1919.

more than two apartments are to be supplied from one common stair, the problem increases in difficulty. In some cases four apartments may be supplied, but more than that requires long halls and generally the passing of every room and the bath before reaching the living room. If two separate stairways with a common hall on the first floor are used, the problem is simplified; that is, as to the planning. But troubles begin when the architect starts to demonstrate the advantage of the scheme to the speculative owner. Immediately the cry of expense and waste space is raised. Yet, in the examples illustrated, the difference in the cubic contents saved by having two elevators instead of one, and the resulting long halls, amounts to much more than the cost of the extra elevator, and the interest upon the money thus saved added to the cost of decorating and repairing the extra halls is enough to pay the expenses of running the second elevator. This is again disregarding the added advantage to the building in having such direct access to the apartments from elevators, or stairways, and the additional attraction of service of an extra elevator.

That this is not an isolated case is shown in the two plans of non-elevator apartments, Figs. 10 and 11, the former, built several years ago, and the latter a new plan by A. J. Thomas. Comparing these in the same manner as above, but taking the building at \$17 per square foot, Fig. 10 is as follows:

Property, 10,000 sq. ft. @ \$3	\$30,000
Building, 7,875 sq. ft. @ \$17	133,875
Cost	\$163,875

Divided by the area of the rooms, 23,675 sq. ft. = \$6.91 as the cost per square foot of rental space. The building covers 78% per cent of the plot.

Figure 11:

Property, 10,000 sq. ft. @ \$3	\$30,000
Building, 6,760 sq. ft. @ \$17	114,920
Cost	\$144,920

Divided by the area of the rooms, 21,820 sq. ft. = \$6.64 as cost per square foot of rental area. The building covers 67 per cent of the plot.

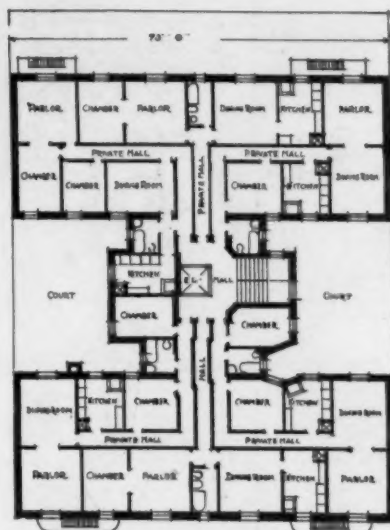


Fig. 6

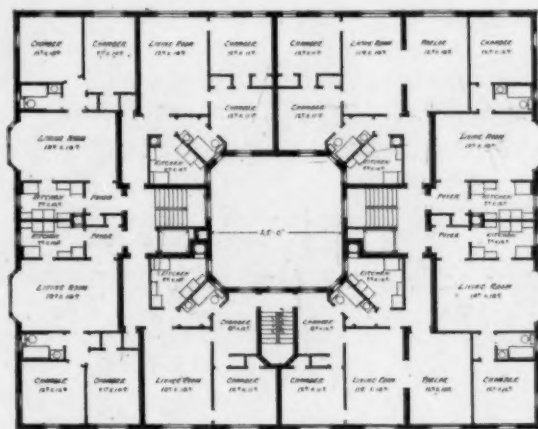


Fig. 7

Elisha H. Janes, Architect

These buildings are on similar corners and have the same number of rooms and baths, yet the latter costs \$18,955 less to build; and the rentals, if anything, should be greater, as all the interior rooms look out on larger courts. The same applies to plans in Figs. 4 and 5.

An unfortunate condition is that ultimate investors do not build in the first place, following instead the practice of purchasing from the speculator or the operator. If the opposite were the case, we would have far better buildings both in design and construction. One of the

arguments advanced by the speculative builder is that he can build cheaper than the owner and thus save to the owner the profit he pays. The majority of speculators do build cheaper even than a reput-

able builder can, due to their methods and often lack of conscience; but the ultimate repair bills tell a different story. But aside from that, take into consideration the profits, bonuses, interest charges the speculator has to pay and add them to the cost of the building, and the balance sheet is apt to show up very differently.

There is first the profit the speculator pays to the operator who has sold him the lots, for it is seldom he

has been able to purchase the property from the original owners—by that is meant the owners other than those who are professional buyers and sellers of property. He then pays a commission to obtain the building loan—perhaps a bonus with it. He pays the highest rates of interest, cannot profit by buying for cash, has to pay a commission and possibly a bonus for the permanent mortgage, and if not successful in selling within a year will probably pay a second commission and higher bonus for a second mortgage, and finally a commission to a broker for selling the property.

Here are the interest figures and profits paid in the erection and financing of one apartment erected in New York, which is not an exception.

The operator purchased the property at an auction sale of an estate and sold it to the specu-

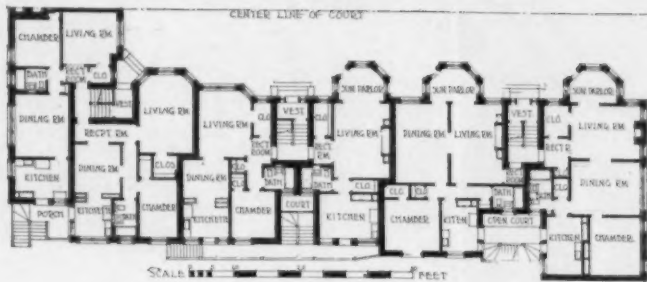
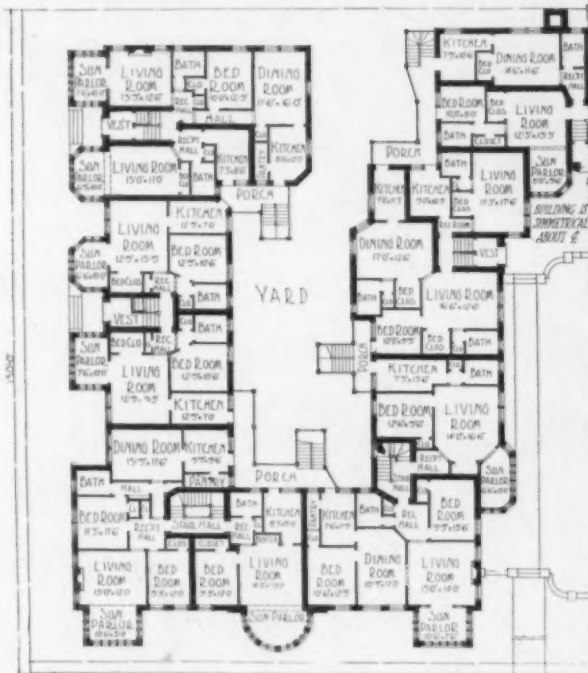


Fig. 9. Half Typical Floor Plan and Diagram of Complete Building Showing Development of Deep Lot. Chicago Apartments. Edward Benson, Architect

Fig. 8. Half Typical Floor Plan of Chicago Apartments. Robert L. Kane, Architect

lator within two months for a profit of \$105,000.00 taking back a purchase money mortgage for the whole amount. It took one year to complete the building. The figures showed as follows :

Profit to operator	\$105,000
Year's interest at 6 per cent on \$280,000 purchase money mortgage	16,800
6 months' interest on building loan, \$650,000 at 6 per cent	19,500
Taxes 2 per cent	5,600
Commission to obtain permanent mortgage of \$730,000	25,000
Building sold at profit of	110,000
Commission to agent for sale of property	10,000
	<hr/> \$291,900

The final owners of the building had sufficient

credit to have obtained the necessary funds with the minimum commission and interest, so their expense above the actual building would have been about as follows :

Interest on \$280,000 at 5 per cent	\$14,000
6 months' interest on \$650,000 at 5 per cent	16,250
Taxes	5,600
\$730,000 at 2 per cent, commission for mortgage	14,600
	<hr/> \$50,450

or a saving of \$241,450, or 23 per cent of the total purchase price, and 38 per cent of the cost of the building—a percentage it is doubtful if the most conscienceless builder could save, and an amount well worth the worry the investor would have had.

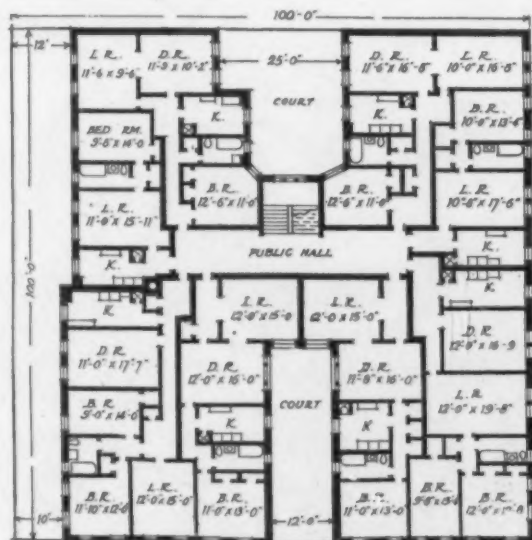


Fig. 10

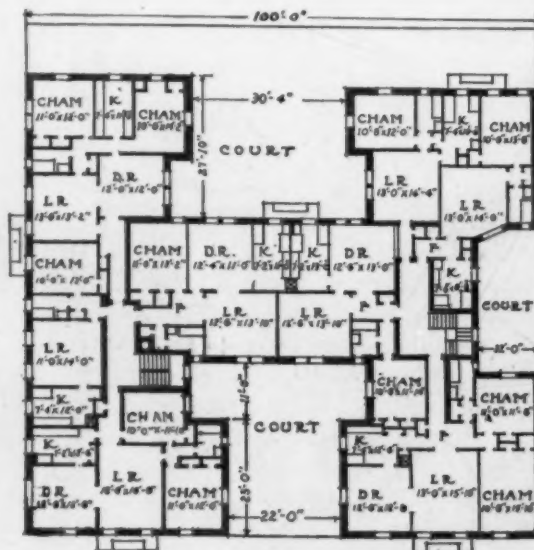


Fig. 11

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

The Design of Industrial Plants

By H. L. GILMAN

THE term "industrial plant" is a very broad one, covering as it does all buildings or structures in which the raw products of mine, forest, agriculture, etc., are prepared for human use or consumption. Facilities for handling, storage and distribution of products, both raw and finished, may well be included in the term.

While many classes of these structures should be strictly the work of the trained industrial engineer, there are other classes which should be handled by the architect, or, at least, by an engineer in co-operation with the architect. Especially is this true at the present time of great industrial development when the manufacturer is paying more attention than ever before to permanent construction and clean, attractive surroundings, to keep his employees contented, and reduce as much as possible the expensive labor turnover. More attractive exteriors, well laid out grounds, restaurants, garages, recreation buildings and grounds, and, most important of all, housing facilities, are some of the new problems in the design of the industrial plant of to-day.

The first step in the design of an industrial plant is selection of the site. This involves consideration of the source of raw materials and the quantities to be used per unit of time. If they are bulky and there is much waste, as in the use of lumber, for instance, the plant would be located near the source of the logs. The lumber mill must also be located near a source of cheap power.

If a plant uses raw materials in considerable quantities from various sources, then proper and adequate shipping facilities are important. Again, an industry which uses comparatively small quantities of raw materials, but adds a great amount of labor to the finishing of its product, should be located near a source for the labor required.

Sometimes, too, the consideration of the market for the finished product is the important factor in locating an industry, but not so often as one would believe. The writer has in mind three large and very successful builders of heavy machinery, practically all of which is used in the Central States and in the western mining sections, and yet they are located in eastern Massachusetts. That their business is growing, may be seen from the fact that they are enlarging their plants or are preparing to enlarge them at the present time.

Other factors in the local selection of the plant are: the class of buildings required, nature of the soil with regard to foundations, shipping facilities, housing facilities, sources of power, water, etc., street and fire protection advantages.

Industries requiring heavy machinery, and one-story buildings covering a large area, should have a site of ample area for present construction and future extensions. The land, therefore, must not be too expensive. Again, a factory which may be housed in a multi-story building may to advantage be constructed on expensive land in order to obtain other advantages, as convenience to market, labor, power, etc. The nature of the soil sometimes has an important bearing, where heavy loads are carried, as a cheap site requiring expensive pile foundations may be more expensive than one with good soil that costs much more.

A plant shipping and receiving large quantities of materials by rail or water should be well located with respect to these facilities, so that there may be ample sidetracks on the property.

The problem of the convenient housing of employees is an important one and should receive careful consideration, not only with regard to housing, but to street car or other means of transportation of employees to and from the works.

The first work to be done after selecting the site should be the preparation of a plan of the site, with railroads, wharf (if any) and streets located and grades indicated. This plan should also show all underground water, electric and sewerage lines. While this is being done the flow sheet or routing diagram is made up. This, together with calculations of quantities of raw materials used and product turned out, will be used to determine the size and location of buildings, locations and necessary length of sidetracks, capacities of storage bins, yards or buildings, and warehouses and shipping buildings for the finished product. The location of these with reference to their uses and to the handling of materials to and from them requires careful study. For instance: In a foundry, coke, pig and scrap iron should be unloaded from the cars and stored where they may be transferred to the cupola charging floor with but one handling, either by cars on an industrial track, if on the same level, or by traveling crane with a lifting magnet or a grab bucket, or other economical

means which may be devised. Moulding sand must be stored convenient to moulding floors, flasks and patterns must be easy and convenient of access, and finally, finished castings must go to the shipping platform, storage or machine shop. This problem of handling materials applies to a greater or less extent to every industry, though there are probably few having more complicated problems than the large machine works turning out several millions of pounds of finished materials per month, where every ton of finished product means at least three tons of raw material handled.

If the industry is to have its own power plant, the location of this important adjunct should be carefully studied. There should be ample storage space allowed for fuel, and it is advisable to have a special side track so that there may be no interference with the unloading of fuel at any time, particularly in plants of medium and large size, and by all means proper equipment for handling coal with the least possible manual labor.

In designing the boiler house it is well, if an overhead coal bunker is not part of the original equipment, to plan the building so that one may be put in at a later date without necessitating any considerable reconstruction. Also both boiler room and engine room should be arranged, if possible, so that they may be extended in the future, as it has been the writer's experience that heretofore in many plants no provision has been made for such extension, resulting in the housing of this most important machinery in inadequate space and consequently with wasteful crowding.

In one recent instance additional boilers were installed in the space which had been allowed, but no provision had been made for an overhead bunker, — quite necessary when automatic stokers are used. The building was on a pile foundation which would not carry much additional load, so that in order to build the bunker it was necessary to erect an entirely new and heavy steel structure entirely spanning the old boiler house, at an expense greater than the original cost of the building.

The power house may be located at the most convenient point for handling of fuel and ashes, because electric transmission and underground pipe lines will carry power, light and heat to any desired point.

Another important step in the design of industrial plants is the selection of materials of construction. This should be decided by the character of buildings and the conditions of the local market. In some sections of the country, with the present high cost of lumber, reinforced concrete is about as cheap as standard wood mill construction with brick walls. In some types of buildings, as,

for example, one-story shops with wide bays, only steel trussed roofs supported by steel columns and brick or concrete walls are suitable. For spans of over 30 feet, reinforced concrete for floors and roofs is not as a rule economical, but this is a matter for comparison on each individual job. Spans for roofs up to 60 feet have been used with fairly good economy. A comparison of the costs of reinforced concrete and steel frame buildings at the present time will probably show very little difference. In 1911, estimates for a large ten-story warehouse gave reinforced concrete an advantage of only 3 per cent over steel frame, and this was offset by the saving of floor space by the use of steel columns. Recently on a six-story building carrying heavy floor loads the elimination of two rows of columns and use of longer spans in the steel frame building showed an advantage in cost of 5 per cent for steel frame over concrete, with a considerable saving in floor space, although the building was slightly higher than would have been necessary in concrete construction.

Roofs of multi-story buildings will naturally be of similar construction to the floors. In one-story shops and mills, however, selection of material for the roof requires some study. If the nature of the contents requires automatic sprinklers for fire protection, then roofs of plank on timber purlins will probably be the most economical; but in machine shops, foundries, etc., where sprinklers are not required, a roof of concrete on steel purlins and trusses will prove least expensive, as saving initial cost and maintenance of sprinklers. Gypsum roofs are used to some extent, both in pre-cast slabs and monolithic construction, thereby lightening the load and reducing the cost of structural steel over that required for a stone concrete roof.

The matter of condensation should not be forgotten in designing a factory building, as considerable damage may be caused by the water dropping from underside of the roof. Concrete is particularly subject to this trouble unless insulated. A layer of cinders containing just sufficient cement to hold it in place on top of the concrete and on this, finished roofing material, makes a good type of construction which should eliminate condensation.

The proper and adequate lighting of industrial plants is of great importance. Large windows with solid steel sashes have almost entirely replaced the old style wooden sashes and window frames, enabling the use of larger windows and providing better ventilation and lighting, which is in many cases had at a less cost than for wood. In case of outside exposure to fire danger the use of wire glass in steel sashes gives a protection equivalent to the expensive and troublesome shutters.

In planning the location of windows, as a rule

the sill should be 3 feet or more from the floor, and the head or top of the window as close to the ceiling as possible. In wide shops one or more monitors with pivoted steel sashes in either side give excellent lighting and ventilation as well. These sashes may be arranged to be operated mechanically from the floor at one or more points, either by hand-pull chain or by electric motor.

For covering large areas of ground with one-story shops the sawtooth skylight gives the best solution to the problem of lighting. With interior surfaces painted white and ribbed glass in the sashes, the diffusion of light is as nearly perfect as possible. With the monitor form of lighting the head room may be less than in the ordinary form of wide building, thereby reducing the cost. This, of course, does not apply to shops requiring heavy traveling cranes which require the high bay and monitor windows. With the sawtooth lighting, north light may be obtained, thus doing away with the direct sunlight and the attendant deep shadows.

In our severe northern climate one disadvantage of the sawtooth construction is probable leakage, due to snow and ice filling the gutters, unless great care is taken in the design and construction. Condensation should be overcome by means of gutters under the glass leading to the outside or to conductors. Care should be taken, also, to provide for ample ventilation. The heat, too, due to the low and thin roofs, may be excessive at times. The sawtooth roof is much used and is well adapted to weaving sheds of textile mills, light foundries and machine shops, and other structures requiring good light and no heavy cranes.

Planning the layout of the floors in an industrial building or group requires a knowledge of processes, machinery and character of the materials handled, and here, the flow sheet and routing diagram come in. From these the machine positions are laid out, with a view to obtaining a flow of materials with as little interference as possible and without conflict of materials flowing in opposite directions. The writer recalls a plant where materials going to and coming from a dry house passed on trucks over a single bridge not sufficiently wide to permit two trucks to pass each other. This caused much delay and loss of time through waiting, and at times promoted heated arguments among the workmen using the bridge. A slight change and an additional bridge at little cost made one-way passages and brought the dried material nearer the machines where it was to be worked.

It is well here to discuss the experience or knowledge required for the successful design of industrial plants. The average manufacturer thinks that he or his own organization is the only one

who knows enough about his business to design his new plant, because he has many formulæ or processes which no one else knows; whereas these things are of very little importance to the engineer or architect, who knows that all manufacturing is a series of operations or the passing of materials through the various machines or appliances. The real problems are those of properly routing the work and conveying or handling materials through the various processes, and the engineer who has designed plants of all kinds and is familiar with the modern methods of handling materials, with labor and power-saving appliances, and the best systems of construction adapted to the different classes of industries, is far better equipped to design the new factory than the owner and his staff. The designer, however, should always co-operate with the manufacturing expert or the owner, who will as a rule select suitable machinery and work out the sequence of processes.

There are certain classes of manufacturing, such as textile and paper making, in which the designing engineer should have a thorough knowledge of all processes, for to obtain economical production, the buildings must be designed with a view to housing the machinery to the best possible advantage. There are few if any industries outside the textile field requiring such large numbers of duplicate machines, all of which must be so placed that they are accessible, arranged to be driven in groups, and each properly located as to lighting. Paper mills have few machines, but large, and a multiplicity of piping, and they consume a considerable amount of power, which must be properly distributed.

Planning for future extension should always be kept in mind in designing an industrial plant of almost any character. It is well to arrange buildings so that they may be extended in the future with the least expense and least possible interruption to business. In fact, many plants are laid out so as to cover the largest possible future growth, and then only the needed number of units built.

Careful consideration should be given by the architect or engineer to fire prevention and fire protection. Processes in which there is great danger of fire or explosion should be housed in isolated buildings. Large areas containing inflammable materials should be divided by fire walls, and well protected by fire hose, extinguishers and automatic sprinklers. Even fireproof buildings should be equipped with automatic sprinklers when containing inflammable materials. It is well for the designer to consult and co-operate with the engineers of the local insurance boards, as by so doing he is likely to save his clients much money

in reduced insurance rates and in safety from fire, particularly in important works.

Buildings exposed to outside fire exposure should have either steel sash and wire glass or fireproof shutters wherever the exposure occurs. Outside fire hydrants and hose houses are important considerations in large plants, particularly when the area covered is of considerable size.

Modern equipment for the handling of materials—raw, finished and in process—has become so efficient and complete as to do away with a large amount of the hand labor of the older processes. Conveyors should be installed wherever they will displace enough hand labor to pay for the investment, and this may be easily determined by the engineer. In a large brass foundry, for instance, a conveyor carries the metal from basement to ~~charging floor~~; the molten metal is conveyed to the moulds by traveling cranes. A conveyor belt under a grating in the floor returns all used moulding sand to the sand basement, where it is mixed with new sand after screening and brought up by another elevator and conveyor and distributed to the moulding floor. Much of this work was done by wheelbarrows and trucks heretofore.

An important point in the design of industrial buildings is to have all the plans carefully checked to see that there is no interference of air, steam, water, gas and plumbing pipes, electrical conduits, etc., either with each other or with other parts of the work, as it is annoying, at least, to find when the work is well along that a large water pipe has been placed exactly where a trolley system was to be hung on the ceiling. It is also necessary to see that crane runways are kept clear of piping and other work. Electric panel boxes, which are quite bulky, should be located so as to be easily reached and also to clear machinery and passageways.

Foundations for heavy machinery and of chimneys should be kept entirely separate from building foundations, as vibration or unequal settlement is likely to cause cracks which in the stack will reduce the efficiency of the draft.

To describe the many types or kinds of buildings required for industrial plants would require a large treatise in itself. They may be separated into three general types. The one-story, three-bay construction for foundries, forge and machine shops for medium and heavy work, requiring heavy overhead cranes; the one-story sawtooth or monitor lighted building for lighter work, requiring no heavy cranes, which may be of any width and any number of bays, and the multi-story building for all types of manufacturing purposes, as well as storage, except of the heaviest character.

The first usually has a wide center bay served by one or more heavy traveling cranes, and usually from 30 to 60 feet to the roof, and a narrower bay on either side for the lighter machine tools, tool rooms, etc. Foundries are usually similarly arranged, with melting furnaces, core shops and core ovens in one bay, heavy moulding in the center bay, and machine moulding, cleaning, sand blast, etc., in the other side bay. The usual construction of these buildings is of brick with steel trusses, and concrete or wood roof. The windows are as large as possible, and by monitors the room is well ventilated and lighted. Steel sash may be said to be used exclusively in this class of building.

The second class, usually the sawtooth roofed building, may be of any width, and the columns may be spaced to suit the requirements of the work. A good long span with bays up to 60 feet wide, and the roof carried on steel trusses, is about as cheap in first cost as closely spaced bays with beam construction to support the roof, and gives excellent working space. Lengthwise a 20-foot bay will be found economical and very convenient.

The third type, or multi-story building, is the type with which architects are most familiar and is too broad a class to be covered in this article. In this type of building, frequently housing hundreds of employees, great care must be used in allowing safe and sufficient exits and ample elevator equipment for handling materials and carrying passengers to the upper floors. The transmission of power electrically has greatly simplified the distribution of the same to the various floors, so that the old belt tower is now done away with.

The width of the building should be determined by the requirements of the equipment, and the possibility of proper lighting. Shoe factories are, as a rule, rather narrow compared with other factories, usually about 45 feet with 50 feet as the maximum. Textile mills vary from 75 to 125 feet or even more for all departments except weaving, which requires good light and for which the sawtooth weave shed is now usually preferred.

Loft buildings and the so-called industrial terminals which are erected for many tenants occupying single floors or parts of floors are designed for general light manufacturing business. Most architects are familiar with this class of building. They should be well built, properly equipped with elevators, stairways, fire escapes and well lighted. They are usually furnished with ample electric power, gas, water, sprinkler service, etc.

In this article the attempt has been made to give only a brief outline of the principles that govern the design of industrial plants in general, with the hope that it may contain some helpful points to architects and engineers generally.

Types of Reinforced Concrete Construction

PART II. FLAT SLAB CONSTRUCTION

By BURTIS S. BROWN, C.E.

BRIEFLY described, the flat slab, as illustrated in Fig. 1, consists of a reinforced concrete slab, without beams or girders extending below the slab, supported on a column with an enlarged capital. The portion of the slab adjacent to the capital is made thicker than the main construction and is called "the dropped head," or "plinth." Both at the circumference of the capital and at the perimeter of the "dropped head" the concrete must be of sufficient thickness to prevent the slab from punching or shearing through the concrete. Besides, the greatest compression and tension occur adjacent to the column capital, so in addition to the increased thickness of the slab an extra amount of reinforcing steel must be placed over the capital. An analysis of the straining in the slab and plinth at the point over the column head and at the edge of the plinth will show an interesting relation between the positive and negative bending moments.

There are many advantages in the use of flat slabs, such as saving in head room taken by beams; clear spaces for sprinkler, steam and other pipes; better surfaces to reflect artificial light; less obstruction to water from fire-fighting apparatus to save contents of room in case of fire. The limiting dimensions of the flat slab as to clear space and thickness make it an exceptionally desirable method for manufacturing and industrial buildings. Spans up to 30 feet square may be used even for heavy loading. In such cases the saving in head room over the steel frame construction is quite apparent.

It is at once obvious, as will be seen by Fig. 2, that the total space saving in a building of legal limit height will amount to many cubic feet, sometimes a full story. In other words, the building represents the maximum available space and the cost is based on maximum actual usable cubic feet.

In Fig. 2 are shown the sections through a building 120 feet high. Each is drawn for columns spaced 20 feet on centers both ways. The story height is 10 feet under the beams or under the dropped head. Section A shows a beam and girder design, while Section B shows a flat slab type. It is readily seen that without making the exterior walls any higher, an entire floor is gained without any additional cost of walls. In cities where the building laws limit the total height of the structure, the flat slab type has a distinct advantage from an investment point of view.

To sustain a live load of 150 pounds per square foot on a span of 20 feet, a slab 8 inches thick is sufficient.

There has been much litigation over different methods of reinforcing flat slabs, but the basic patents expired in April, 1919, so designers now feel more liberty in choosing this layout. The design of flat slabs is more complicated than simple slabs or beams, but now the Joint Committee of the American Society of Civil Engineers has established rules for their design, also the building laws of the larger cities include requirements for calculation of stress.

Metal forms have very recently been placed on the market, which can be rented. These are ad-

justable for different spans and story heights. With these forms a larger section can be removed in advance of the form just above the posts than with other types, thus giving the concrete an opportunity to dry out more quickly and permitting these forms to be used over again immediately. The economical use of forms has been one of the greatest problems of the contractors. Now that a satisfactory solution has been found for that perplexing part of

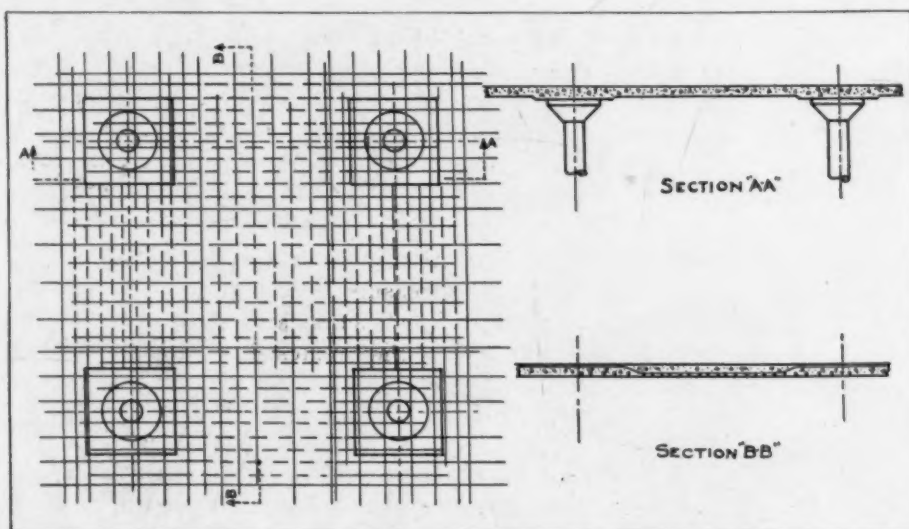


Fig. 1. Diagram Showing Reinforcement and Slab Sections

the work, the builder can estimate with much more certainty on concrete work.

With the introduction of mouldings on the capitals of columns, a decorative effect may be obtained which will eliminate much of the harshness of the plain work. Mouldings are sometimes used on the underside of the flat slab, dividing the continuous flat surface into panels; and there are also many other ways of making a satisfactory, pleasing ceiling.

Flat slabs are best adapted for buildings carrying heavy loads, as warehouses, factories and garages. It is not so well adapted for office buildings, as the column heads interfere with the partitions between rooms, and also the space to conceal pipes, etc., is lacking.

Flat Slabs with Domes

To the designer of flat slabs the large dead weight has always been a drawback. Recently there has been introduced a method of reducing the dead weight of these floors by eliminating the concrete on the underside of the slab between the dropped heads.

In order to accomplish this result, sheet metal domes are placed on the forms and a space of 5 inches left between them. The appearance of the finished floor is much like the underside of the joist system, except in this case the joists extend in two directions and are 24 inches on center. The slab is 2 to 3 inches thick over the top of the dome.

The capital and dropped head are constructed the same as for a flat slab. It is quite common to make the bottom of the joist on the same line with the bottom of the drop head. Of course the ceiling is not smooth, but has indentations or coffer 19

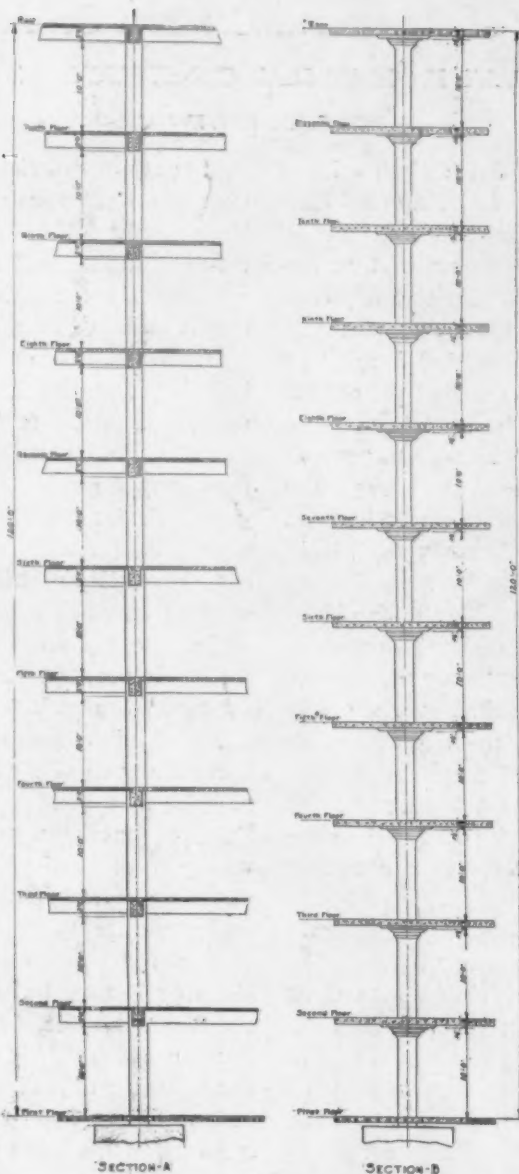


Fig. 2. Comparison of Beam and Girder with Flat Slab Construction in Building 120 Feet High

inches square separated by 5 inches of concrete. Its appearance is best described as the surface of a large waffle cake.

There is a saving of from 30 to 45 per cent in the dead weight of this floor, which means a saving in concrete and steel. Furthermore it makes a saving in the columns and foundations.

For offices or show rooms the indentations caused by the domes can be decorated to give as pleasing an effect as a deeply coffered architectural ceiling.

The metal domes used in these floors are leased, so the contractor does not have to buy expensive equipment to be used only once or twice and then scrapped. They are used many times and only the rental charge has to be absorbed by each floor.

Recently two bays of this type of construction, each with spans of 30 feet in both directions, were tested with a live load of 300 pounds per square foot. The building tested was a public garage, and the floor load used in the design was 150 pounds per square foot, with a 25 per cent reduction, so the actual live load was 2.67 times the designed load. With this large load the maximum deflection was about one-half inch. The allowable deflection at $\frac{1}{360}$ of the span would be one inch. In a careful examination of the top of the slab, where the maximum stresses occur, no cracks could be detected. Therefore, from actual tests, this newest type of floor construction proves its worth.

With the increasing cost of materials and labor, new types of construction are sure to appear, and it is quite likely the greatest innovation will be in the use of concrete.

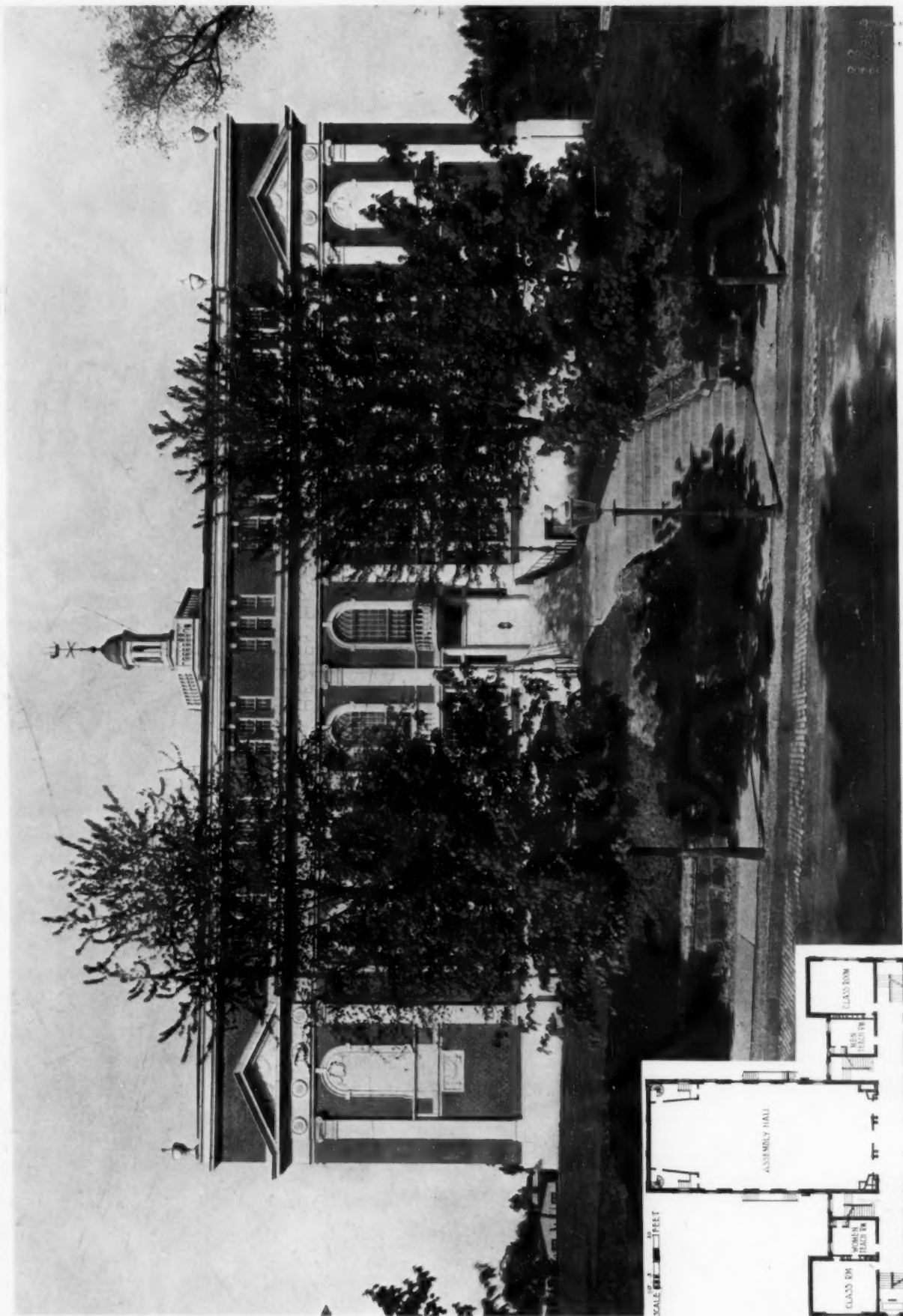


DETAIL OF MAIN ENTRANCE

PORT CHESTER HIGH SCHOOL, PORT CHESTER, N. Y.

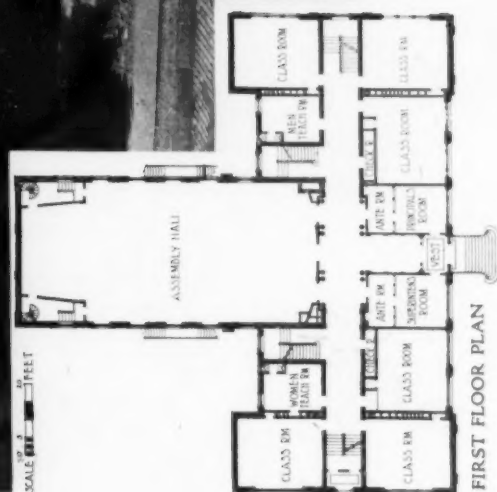
DESIGNED BY WM. LAWRENCE BOTTOMLEY, HEWITT & BOTTOMLEY, ARCHITECTS

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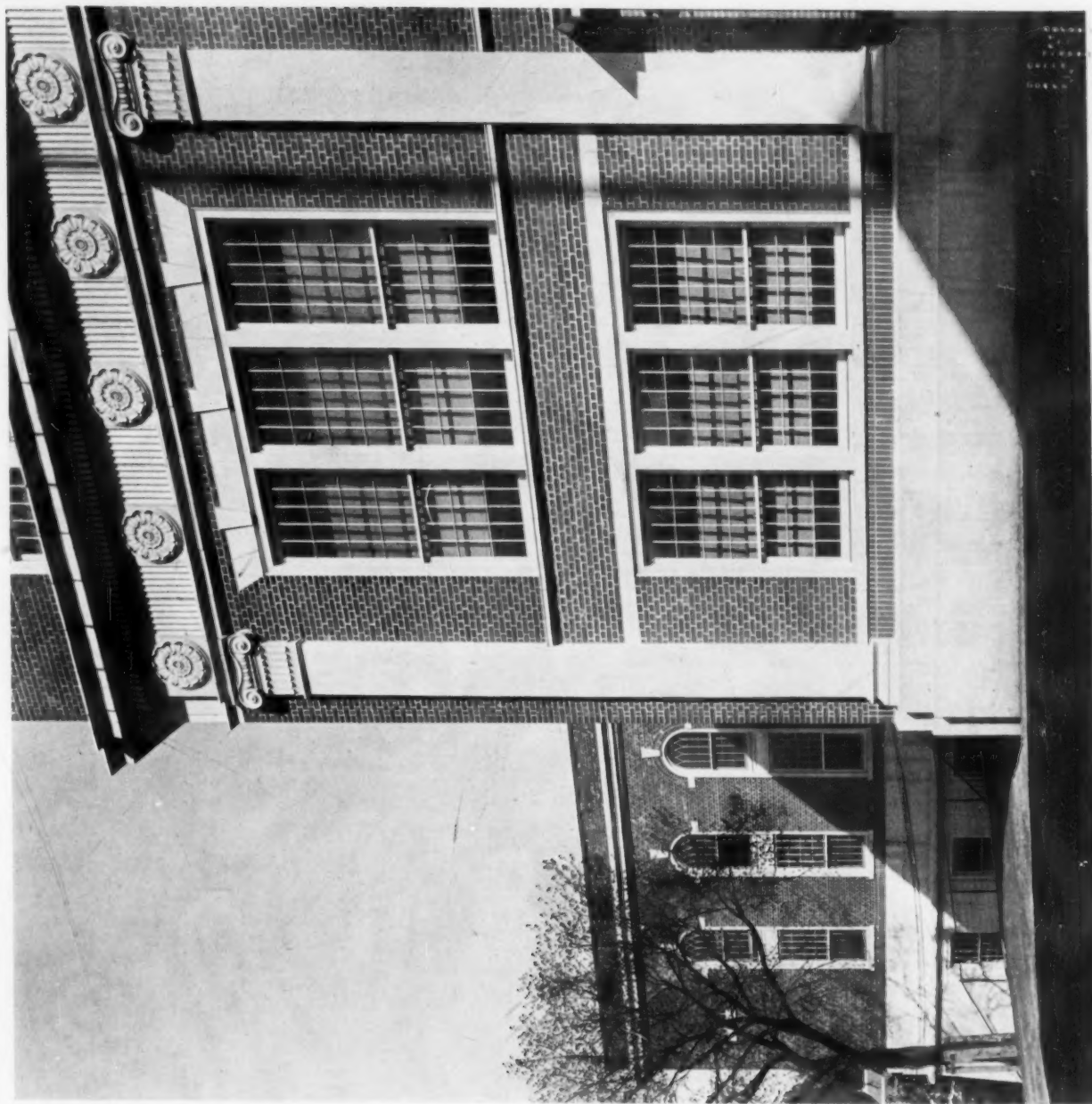


GENERAL VIEW

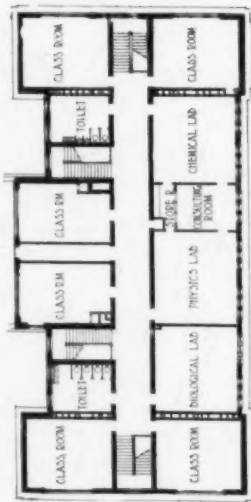
PORT CHESTER HIGH SCHOOL, PORT CHESTER, N. Y.
DESIGNED BY WM LAWRENCE BOTTOMLEY, HEWITT & BOTTOMLEY, ARCHITECTS



1880-1881
1881-1882
1882-1883
1883-1884
1884-1885



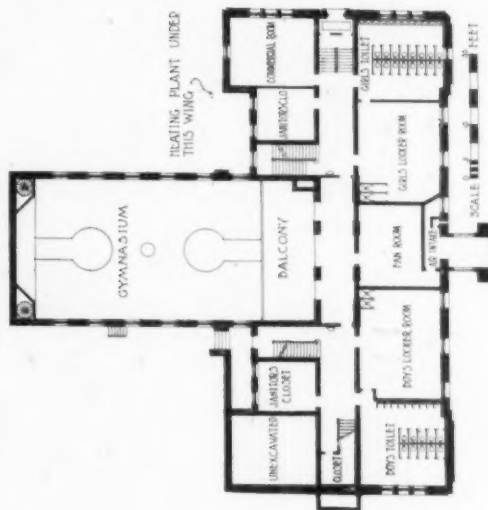
DETAIL OF END AND REAR WING
PORT CHESTER HIGH SCHOOL, PORT CHESTER, N. Y.
DESIGNED BY WM. LAWRENCE BOTTOMLEY, HEWITT & BOTTOMLEY, ARCHITECTS



THIRD FLOOR PLAN



SECOND FLOOR PLAN



BASEMENT FLOOR PLAN

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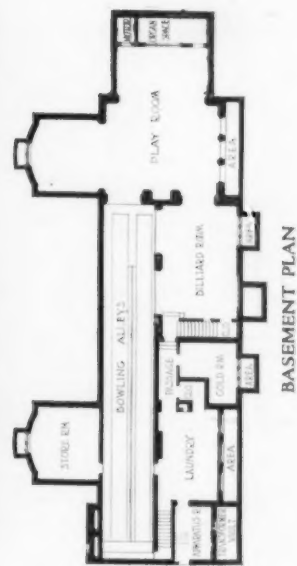


VIEW OF ENTRANCE FRONT
HOUSE OF C. S. MOTT, ESQ., FLINT, MICH.
DAVIS, McGRATH & KIESSLING, ARCHITECTS

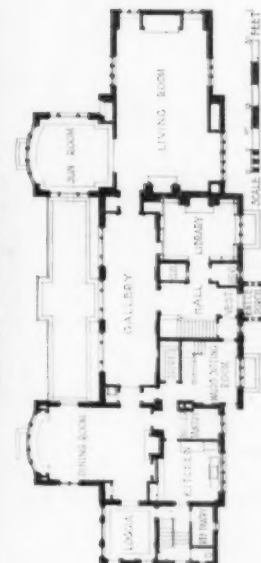
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VIEW OF GARDEN FRONT



BASEMENT PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF C. S. MOTT, ESQ., FLINT, MICH.
DAVIS, McGRATH & KIESSLING, ARCHITECTS

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ALBERT



DETAIL OF STAIR HALL



DETAIL OF ENTRANCE

HOUSE OF C. S. MOTT, ESQ., FLINT, MICH.
DAVIS, McGRATH & KIESSLING, ARCHITECTS

LIBRARY
OF THE
CONGRESS
WASHINGTON



GALLERY LOOKING TOWARD DINING ROOM



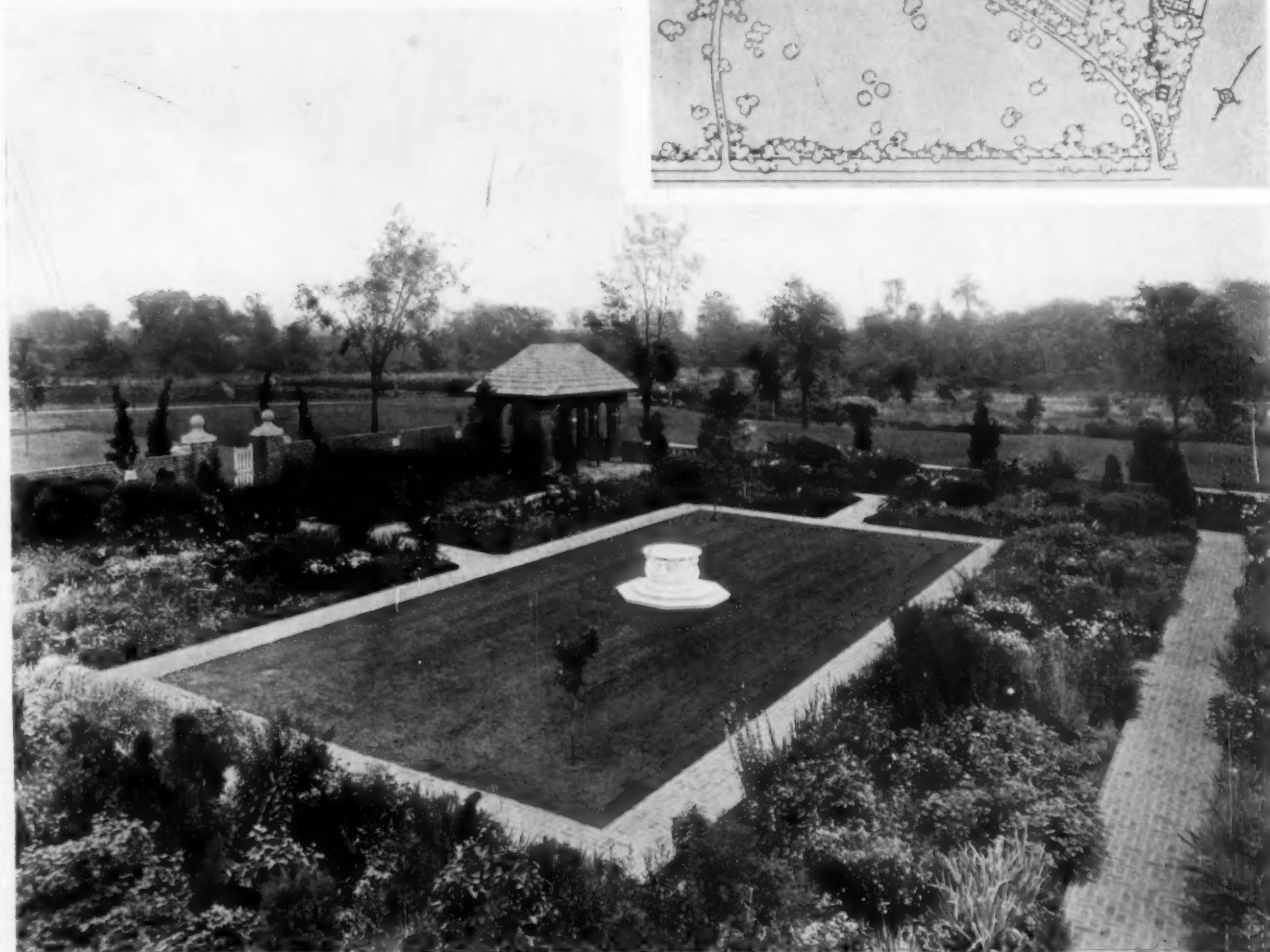
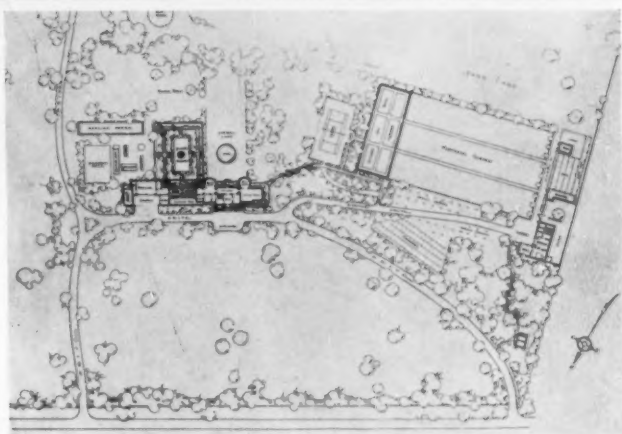
VIEW OF LIVING ROOM
HOUSE OF C. S. MOTT, ESQ., FLINT, MICH.
DAVIS, McGRATH & KIESSLING, ARCHITECTS



20



VIEW FROM SOUTHEAST



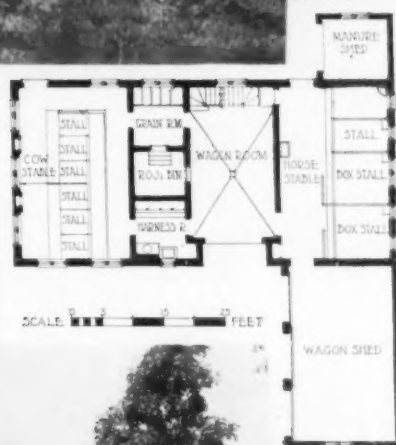
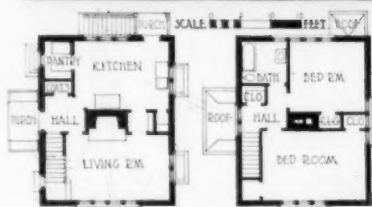
VIEW OF GARDEN FROM DINING ROOM WING
HOUSE OF C. S. MOTT, ESQ., FLINT, MICH.

DAVIS, McGRATH & KIESSLING, ARCHITECTS
WILLIAM PITKIN, JR., LANDSCAPE ARCHITECT

no



VIEW OF STABLE AND LODGE



ENTRANCE SIDE OF LODGE

HOUSE OF C. S. MOTT, ESQ., FLINT, MICH.
DAVIS, McGRATH & KIESSLING, ARCHITECTS

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VIEW OF ENTRANCE SIDE



HOUSE AT FOREST HILLS GARDENS, LONG ISLAND, N. Y.

AYMAR EMBURY II, ARCHITECT
LEWIS E. WELSH, ASSOCIATE

1874
and
1875
1876
1877
1878



VIEW OF STREET FACADES

CHRIST CHURCH PARISH HOUSE, HARTFORD, CONN.

DELANO & ALDRICH, ARCHITECTS

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REAR END OF ENTRANCE HALL

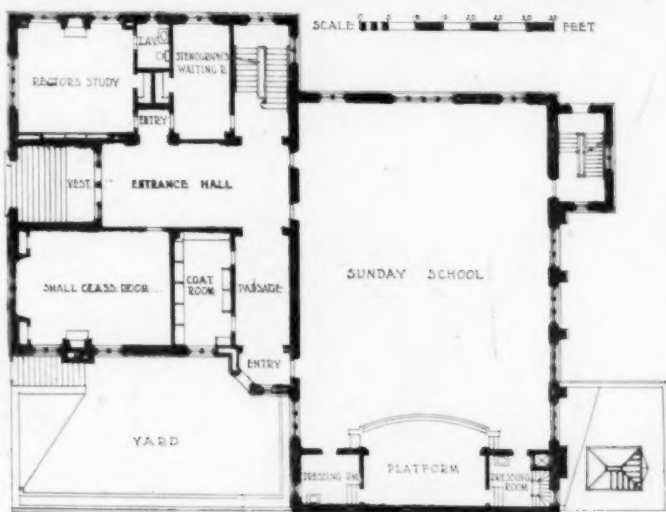


HALL LOOKING TOWARD RECTOR'S STUDY
CHRIST CHURCH PARISH HOUSE, HARTFORD, CONN.
DELANO & ALDRICH, ARCHITECTS

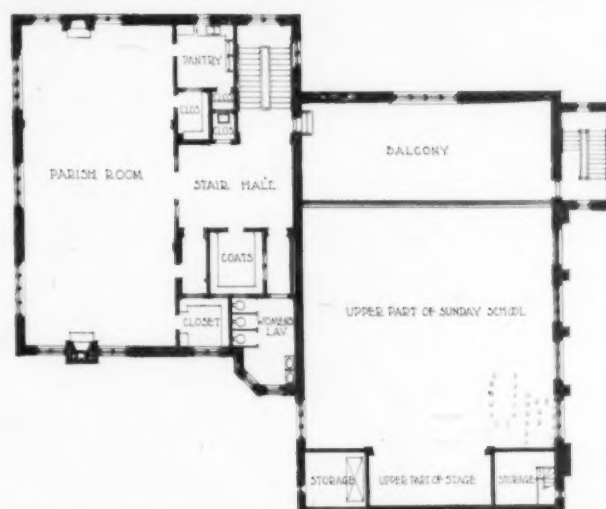
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SUNDAY SCHOOL ROOM



FIRST FLOOR PLAN



SECOND FLOOR PLAN

CHRIST CHURCH PARISH HOUSE, HARTFORD, CONN.

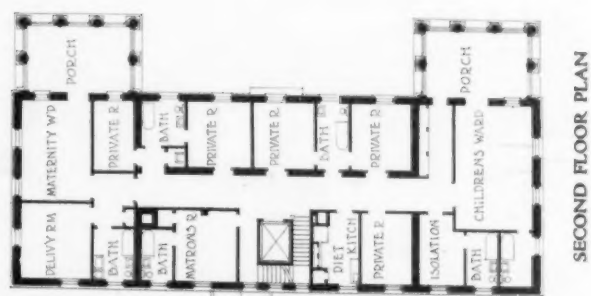
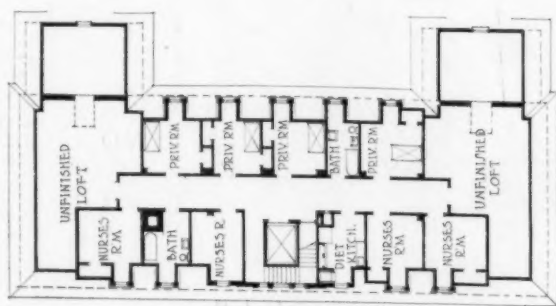
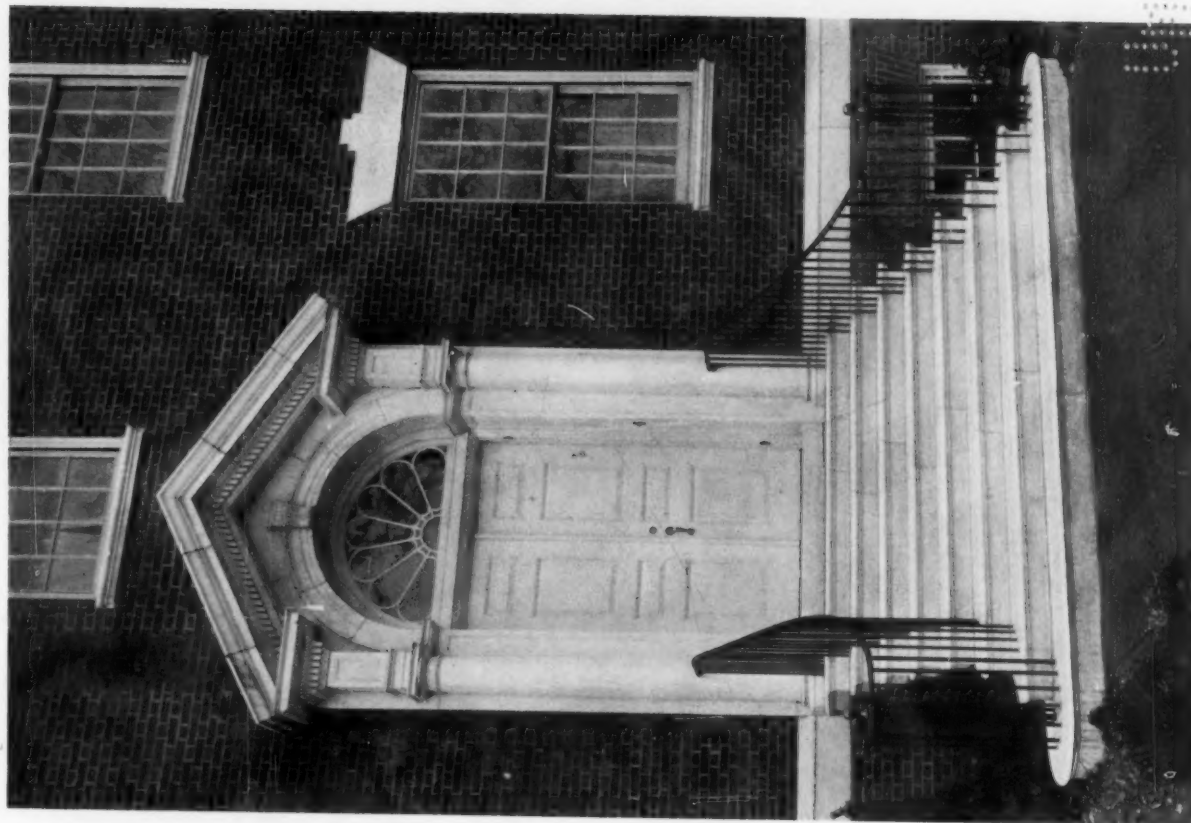
DELANO & ALDRICH, ARCHITECTS

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VIEW OF MAIN FACADE
ABINGTON GENERAL HOSPITAL, ABINGTON, PA.
BISSELL & SINKLER, ARCHITECTS

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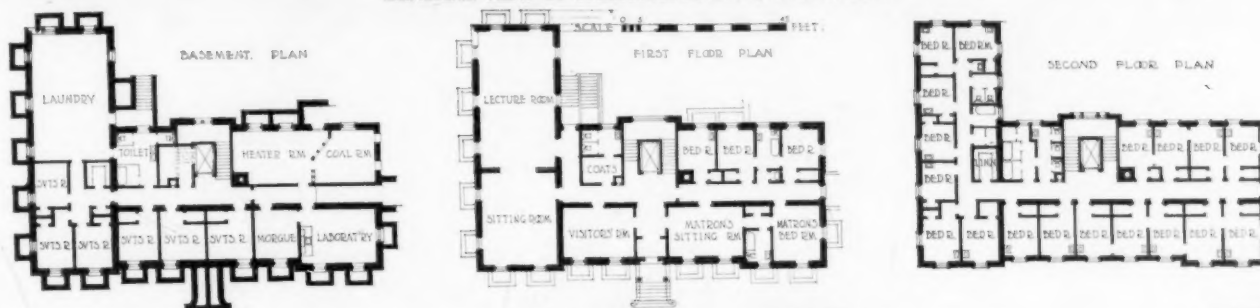


ABINGTON GENERAL HOSPITAL, ABINGTON, PA
BISSELL & SINKLER, ARCHITECTS

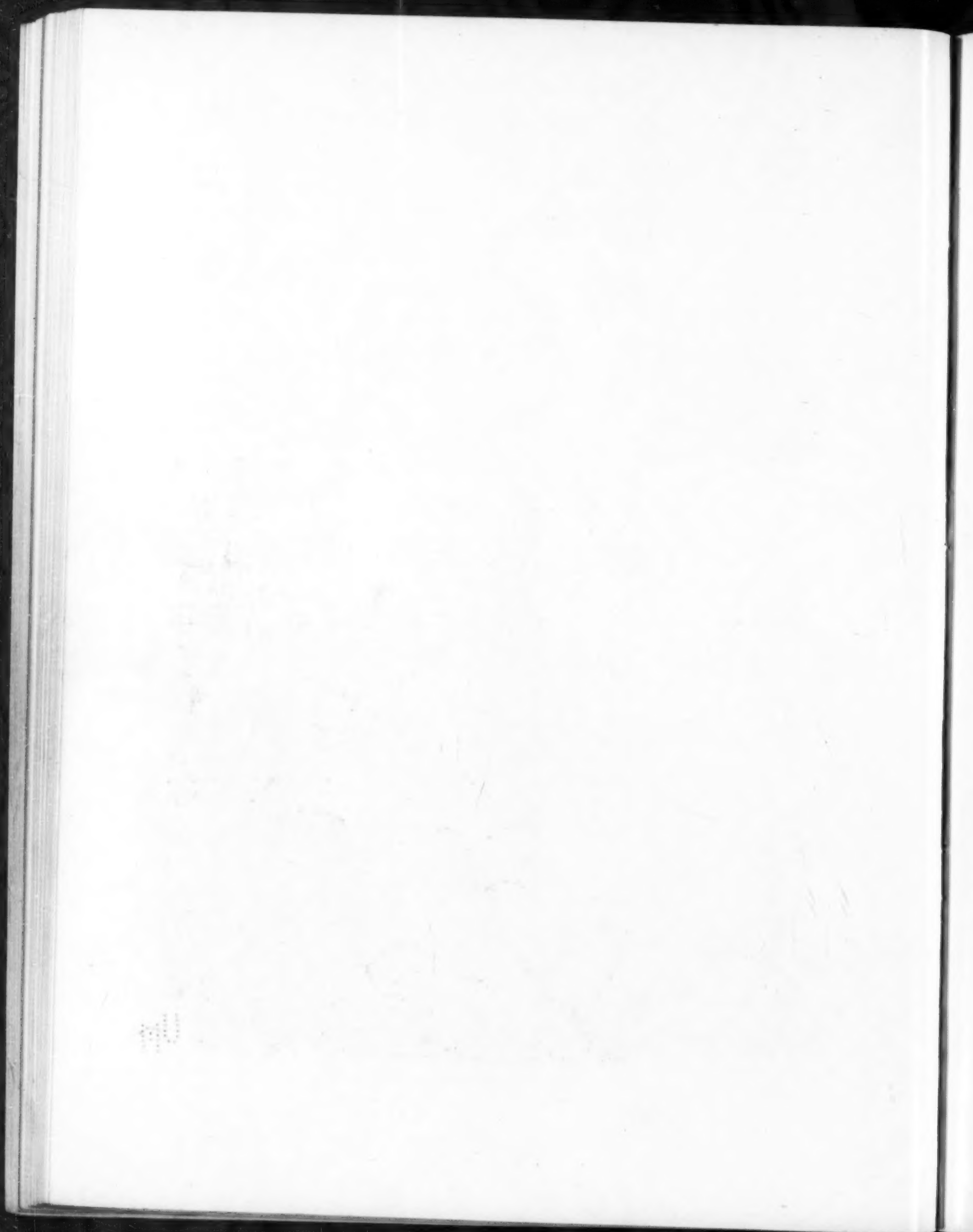
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GENERAL VIEW OF HOSPITAL AND NURSES' HOME



MAIN FACADE OF NURSES' HOME
ABINGTON GENERAL HOSPITAL, ABINGTON, PA.
BISSELL & SINKLER, ARCHITECTS



The Abington Memorial Hospital and Nurses' Home

BISSELL & SINKLER, ARCHITECTS

OF all the beautiful suburbs that surround Philadelphia, none excels the section traversed by the ancient highway still known as the "Old York Road." It is a country of many hills and vales, abounding in streams and patches of woodland; while here and there old houses of stone or brick, having all the charm and dignity that go with well-bred old age, recall the Colonial and Revolutionary days, when Colonial architecture was in its glory. With the advent of the automobile and the extension of the suburban trolley systems, the movement from town to suburb began, and this section had its full share of the increase in population. Small hamlets and settlements changed almost over night into towns of respectable size, and the movement is still going on undiminished in volume.

Soon, with the increase in population, and along with the other amenities of a modern community, came the need of a well equipped hospital, and it was a recognition of this need that, five years ago, prompted a public spirited citizen to build and endow a hospital which was to be of moderate size as befitted its rural setting, but was to include everything that goes to make up the modern hospital. An admirable location was chosen for its site on the northern outskirts of the little town of Abington, on a rise of ground that marks the summit of the northern boundary of the Huntingdon Valley. Open to the sun and swept by the prevailing breezes of summer, it is nevertheless protected by a high ridge of hills beyond, which serves as a barrier against the cold winds of winter.

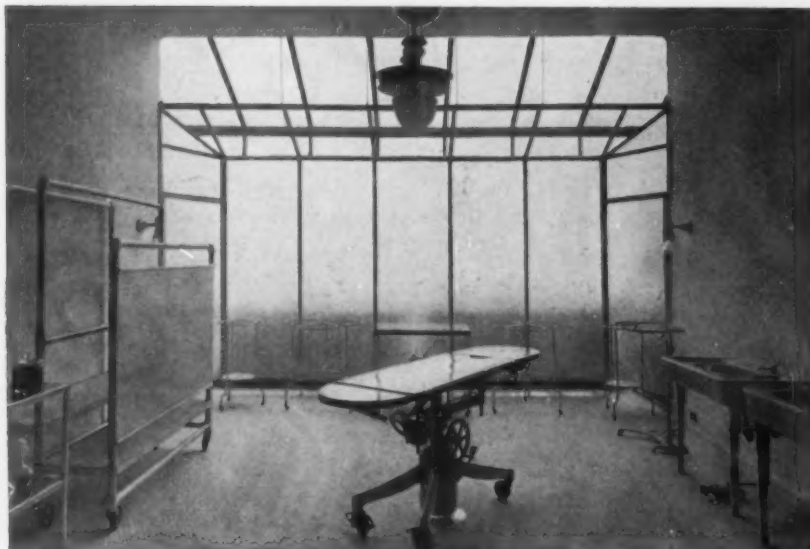
Bearing in mind that its locale is a district strongly reminiscent of Colonial days, the choice of the Georgian style appeared logical. The building, which is fireproof throughout, has exterior

walls of dark red brick with white marble trimmings; the porches are of wood; the roof of slate.

The main points that largely determined the plan were these: the hospital was to be small, and its rate of growth was entirely problematical, therefore all the wards must needs be small, and no division between medical and surgical cases was to be made; there was to be a children's ward and a maternity ward, the latter reduced to its lowest terms; then there was to be an operating room and an out-patient department, and as many private rooms as could be secured after providing for the nurses. Future growth was to be met by additions to the present building and later on by other buildings, the first of which would be a nurses' home; but the operating room and out-



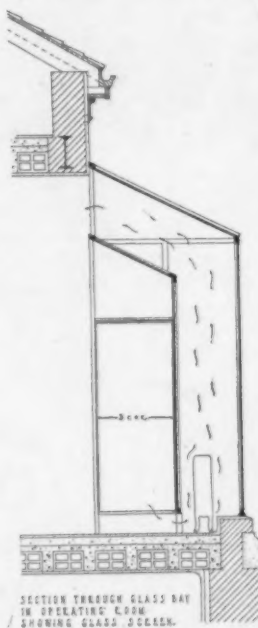
Detail between Porch Wings on Hospital Front



Operating Room Showing Glass Bay

patient department were to be made adequate for some years to come. As one means of future extension to the present building, the walls of the rear wing, which contain the operating room, were designed to carry two additional floors, which would bring the wing up to the height of the main building, and with this in mind, light for the operating room was arranged for by a bay of glass instead of the usual skylights. (See illustration of section.)

That a need had existed for a hospital was proved as soon as the new building was opened and almost at once came a demand for more private rooms. To meet this situation the nurses were taken out of the building and housed temporarily in an old building adjacent to the hospital, thus releasing their rooms for the use of private patients, and two years after the opening of



Detail of Glass Bay in Operating Room

the hospital the erection of a nurses' home was begun. At the same time drawings were made for a power plant which would also contain a laundry and garage; but notwithstanding the serious need for a central power plant, its erection was postponed, and only the garage was built at that time.

The design and materials of the nurses' home and garage naturally follow the main building, and like the latter they are thoroughly fireproof.

The open air porches are conveniently arranged with respect to the various wards and they command an attractive outlook. The ambulance court is located on the side of the building opposite to them and its approach is not in their view.

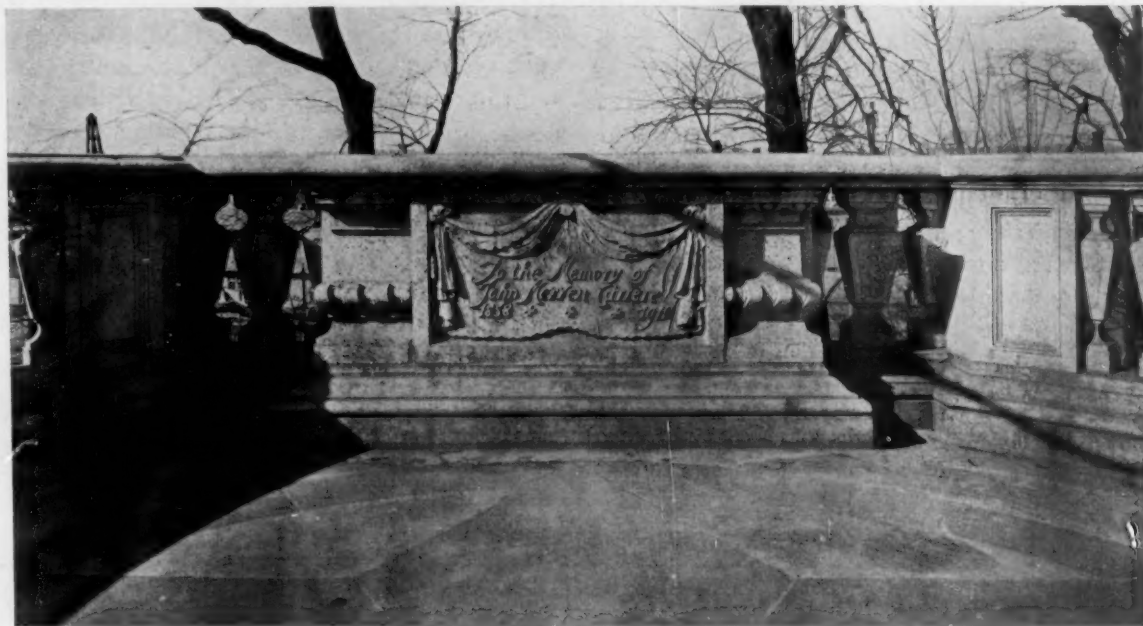
The growth of the hospital has been quite remarkable. The number of patients has risen from 450 in 1914-15 to 1156 in 1918-19; last year 1972 patients received treatment in the dispensary. The time is not far distant when additional buildings will be required, and it seems likely that what was originally designed to be a small hospital serving a rural community is destined to become an institution comparable in size to those to be found in the larger cities.



Hospital and Nurses' Home from the Rear

John Merven Carrère Memorial

RIVERSIDE DRIVE, NEW YORK CITY



THIS exedra and staircase of pink granite was erected to the memory of John Merven Carrère by friends and professional associates of the late architect. It was unveiled and formally presented to the City of New York on Oct. 16, 1919, in the presence of members of the various architectural and art societies of which Mr. Carrère was a member, and as Mr. Joseph H. Freedlander, Chairman of the Memorial Committee, called the name of each society, its president placed a wreath on the memorial tablet.

With the exception of the memorial to Richard M. Hunt at Seventieth Street and Fifth Avenue, New York, this is the only memorial to an architect ever erected in this country. It was designed by Mr. Thomas Hastings, partner of the late Mr. Carrère.

It is situated on Riverside Drive overlooking the Hudson, where it will be an enduring expression of the affection and esteem in which Mr. Carrère was held by his confrères, and will always mark the efforts and creative spirit of a noble man.

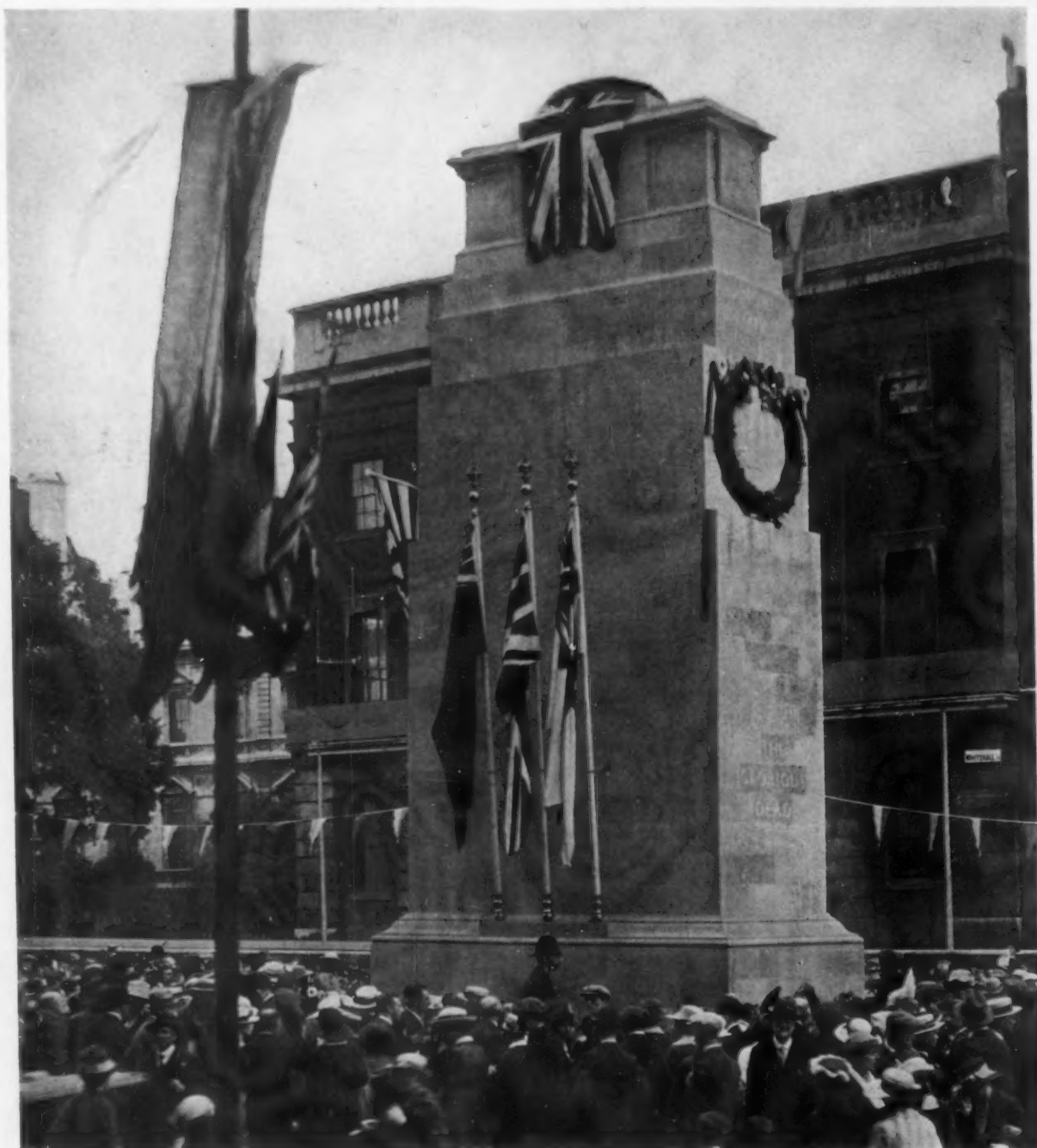


The Whitehall Cenotaph, London, England

SIR EDWIN LUTYENS, ARCHITECT

IT IS not always that a monument of architectural distinction wins immediate public approval, and there is, therefore, great interest to all artists in the circumstances surrounding the temporary cenotaph designed by Sir Edwin Lutyens and erected in Whitehall for the London Peace Day celebration. It was, in the nature of all temporary civic decorations, rapidly conceived and promptly executed for what was thought but a brief space of time; but its excellence as a monument and tribute to "The Glorious Dead" at once impressed the public mind, with the result that an

immediate desire was expressed to have it executed in permanent materials. When it became evident that the public appeal must be granted, the city officials suggested the desirability of other sites in consideration of possible traffic difficulties; but this aroused such opposition that there was no doubting the interest of the public in seeing the monument executed on the same site for which it was created. It is a great satisfaction that a pylon of such simple dignity should command the widest approval. An English contemporary says, "For once we have the right thing in the right place."



• Notes from England

WITH SPECIAL REFERENCES TO POST-WAR HOUSING DEVELOPMENTS

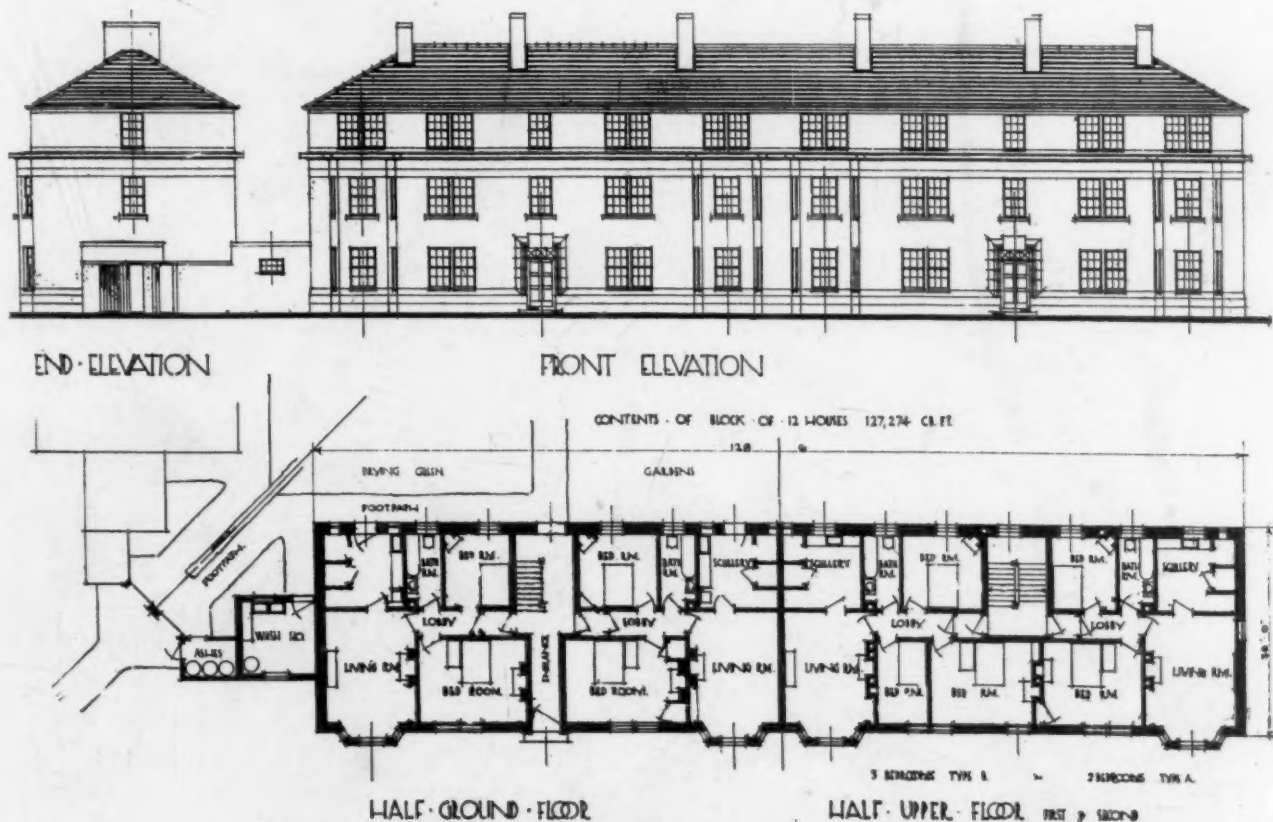
By H. J. BIRNSTINGL, A.R.I.B.A.

IN order that an historian may view events with that dispassionate vision which is so essential if they are to be recorded in their true proportion and with due regard to the success or failure of the results which they achieve, it is necessary that he allow a lapse of time to intervene between himself and the period under review. Nevertheless to whatsoever conclusions the future chronicler of the architectural profession may ultimately arrive, when in due course he deals with the present period, it may with comparative safety be predicted that he will find it possessing many unique qualities, foremost amongst which will be noted the manner in which the present post-war work groups itself under two opposed headings. At the one extreme is the housing problem calling for the speedy erection of hundreds of thousands of adequate yet cheap workingmen's cottages; and at the other extreme, the building of vast commercial premises, for the most part large stores, whose cost may in some cases approximate to a million pounds. The medium sized domestic dwellings—that very type of archi-

tecture which has slowly developed upon a soil rich in tradition through centuries of scholarship and refinement, until English domestic architecture has indeed become justly famous throughout the world for its production—finds no place in the present scheme of things, owing chiefly to the enormously increased cost of all commodities.

The Government department which now has the matter of working-class housing in hand is the newly formed Ministry of Health, which since July 1 has superseded the Local Government Board of England, although Scotland still retains its own Local Government Board.

The country has for the purpose of housing been divided into eleven regions, each controlled by a commissioner assisted by a staff of architects, surveyors and inspectors, whose duty it is to inspect the sites, consider the layout plans, the house plans, the financial aspect in connection with the Government loan, and generally advise upon, and finally approve, the scheme. The chief architects under the Ministry of Health are Mr. Raymond Unwin and Mr. S. B. Russell. The



Type of Tenement House Designed for Local Government Board in Scotland

John A. W. Grant, Architect



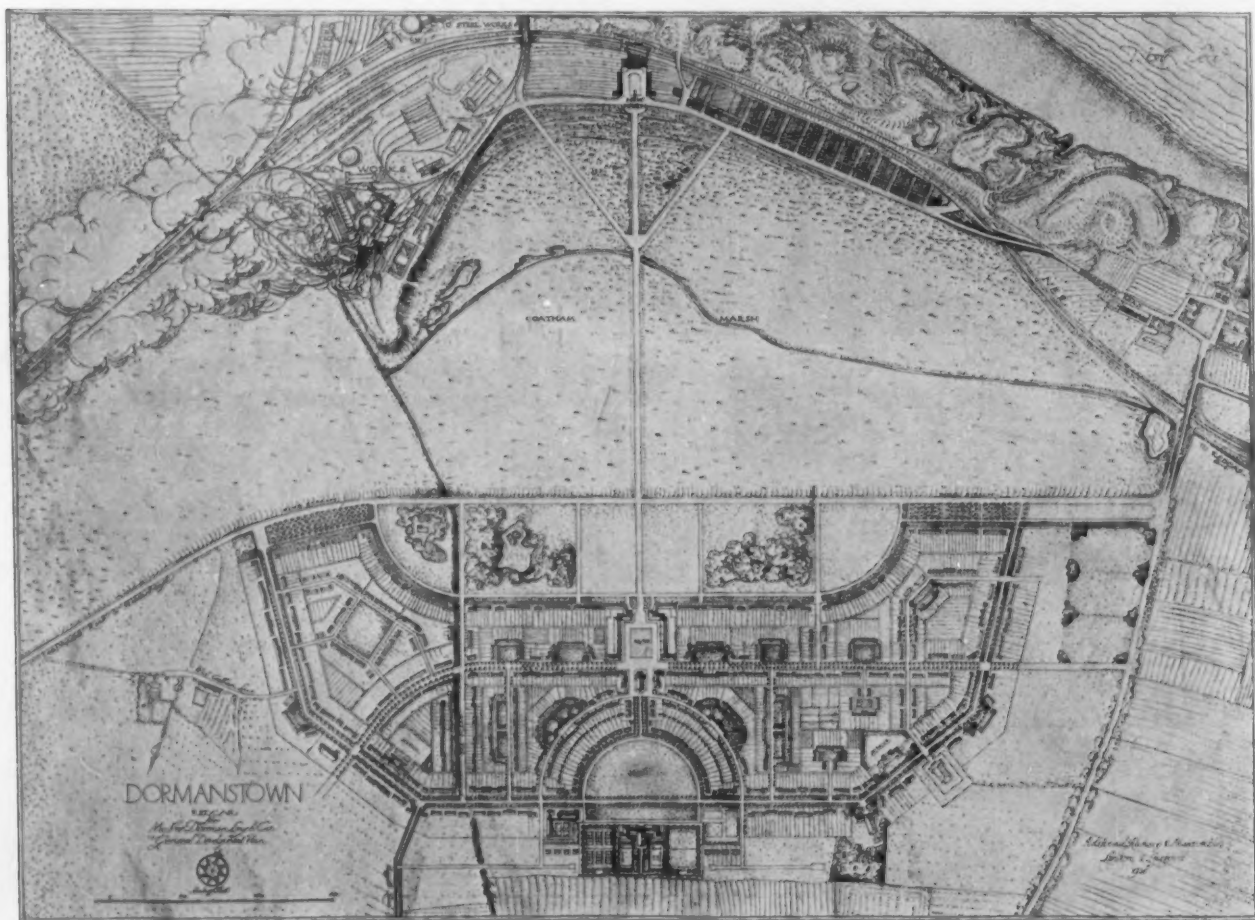
Group of Cottages Bordering Village Green, Dormanstown

latest figures state that houses covering 41,000 acres have been approved by the Ministry.

A marked advance in the science of town-planning is noticeable in most of these schemes, and to a large extent the International Town Planning Conference held in London in 1910, which gave such an enormous impetus to this subject and afforded architects opportunities hitherto denied them of studying the methods of other countries, notably America and Germany, who were so far

in advance of England in the matter of comprehensive and coordinated city layouts, is, together with the pioneer work of Mr. Raymond Unwin, responsible for this great improvement.

The Ministry of Health published a manual on State Aided Housing Schemes some months ago, and this has recently been followed by an equally interesting publication issued by the Local Government Board of Scotland, which includes designs for two and three storied tenement buildings,



Plan of Dormanstown and Vicinity
Adshead, Ramsey & Abercrombie, Architects

which are happily designed to avoid the appearance of depression which so often accompanies buildings of this description—indeed, a pleasant compromise seems to have been struck between the too exclusively rural or urban treatment, pleasing effects having been achieved by the use of such diverse features as the Mansard roof and the horizontal Georgian simplicity.

It is interesting to note how the prevalence of the Georgian influence, which recently received a real impetus by the publication of "Small Houses of the Late Georgian Period," by Mr. Stanley C. Ramsey, A.R.I.B.A., still persists, displaying itself indeed on many a cottage design fresh from the drawing-board. This influence has almost entirely replaced that of Neo-grec which preceded it, and signs are not wanting that in its turn it may yield to an early Victorian revival in the course of a few years.

Amongst the more important housing schemes which are in a fairly advanced condition, may be mentioned that of Messrs. Adshead and Ramsey at Dormanstown. Both Mr. Adshead and Mr. Patrick Abercrombie, who is associated with the firm of Adshead and Ramsey in the execution of the Dormanstown scheme, are professors of town planning at Liverpool University. The following extracts from a description of the village, written by the architects, appeared in *The Architects' Journal*:



Row of Cottages, Dormanstown

"The first three hundred houses of this village were built during the war by Messrs. Dorman, Long & Co. of Middlesbrough, to house the employees at their new works. The village stands on a site open in all directions, permanently separated from the works by a wide strip of common land.

"As will be seen from the plan, the principal feature of the layout is a wide, central avenue leading from the market-place in the north to a large semicircular village green in the center, on either side of which is the more or less symmetrically composed village, with subsidiary tree lined avenues, forming an enclosing ring, the resultant effect being one of completeness and unity.

"The elevations are almost severely plain, depending, as they do, for interest, on their grouping, the careful disposition and proportion of the windows, and the studied details of the doors.

"These cottages, with their neatly sashed windows and delicately moulded doors, have been designed in sympathy with the prevailing architectural note to be found in the older buildings of the neighborhood.

"The elements of these modest and charming Georgian buildings, so characteristic of many of the Yorkshire villages, lend themselves admirably to a system of standardization inseparable from any modern housing scheme which is to be both effective and economical. One of the



Semi-Detached Cottages, Dormanstown

most interesting points in the design of the houses at Dormanstown is the consistent variation in size between the ground floor and the first floor windows, resulting in long horizontal lines, with their suggestiveness of stability and restfulness. The appearance of the village, which was built on an open plain devoid of a single shrub or tree, is at the present moment, as may be gathered from the illustrations, rather bleak; but the landscape gardeners are busy at work, so that it is quite safe to prophesy that in a few years Dormanstown will be one of the most beautiful industrial villages in the north of England.

"The houses already built are pretty equally divided between the non-parlor and parlor type, with three bedrooms and hot and cold water services to the baths and sinks."

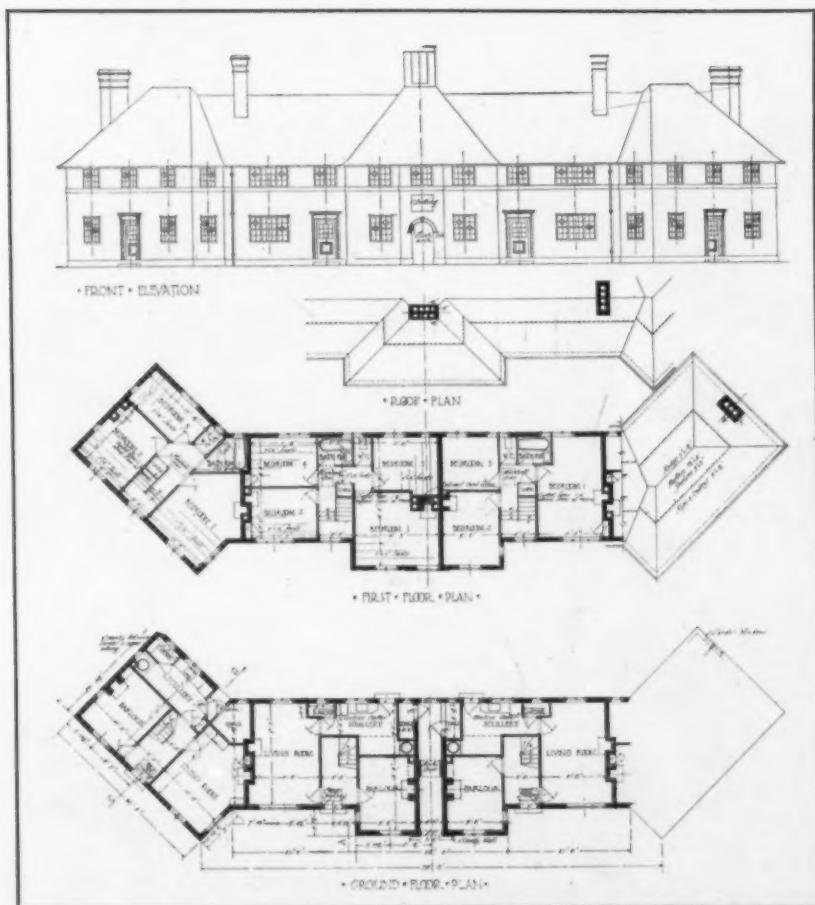
One of the most successful schemes recently approved by the Ministry of Health is one executed by Messrs. Thompson, Hennell & James for a layout of 370 acres at Swanpool, near Lincoln. This scheme was originated by the Swanpool Co-operative Housing Society, Ltd.

As shown by the layout plan, the estate is situated on a nearly level site and contains a large lake, known as the Swan Pool, from which the

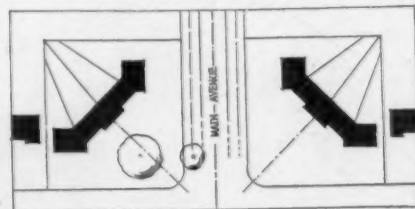
name of the estate is derived. This lake will be available in due course for boating and bathing, and a large portion of the land has been reserved around it as an open space and pleasure ground, being already well covered with trees. On the west side will be the recreation and cricket ground, with pavilion, etc. To the south is shown the technical institute standing in an open square; while extending southwards is the main avenue, ending in the main Central Square, where in due course will be situated the church, free church, institute and other public buildings. Many open spaces are reserved for tennis courts, bowling greens, playgrounds, orchards, allotments, etc. Three shopping centers are shown. Sites for schools, swimming baths, laundries, public bake-houses, power station, etc., are reserved. It will be seen that when completed the estate will combine all the essential elements of a self-contained community. Provision is made for the erection of some twenty-five hundred to three thousand houses, to meet the requirements of residents with either large or small families. One of the most attractive features of the scheme is the proposed installation of central heating and constant hot-water supply, generated in one operation with the

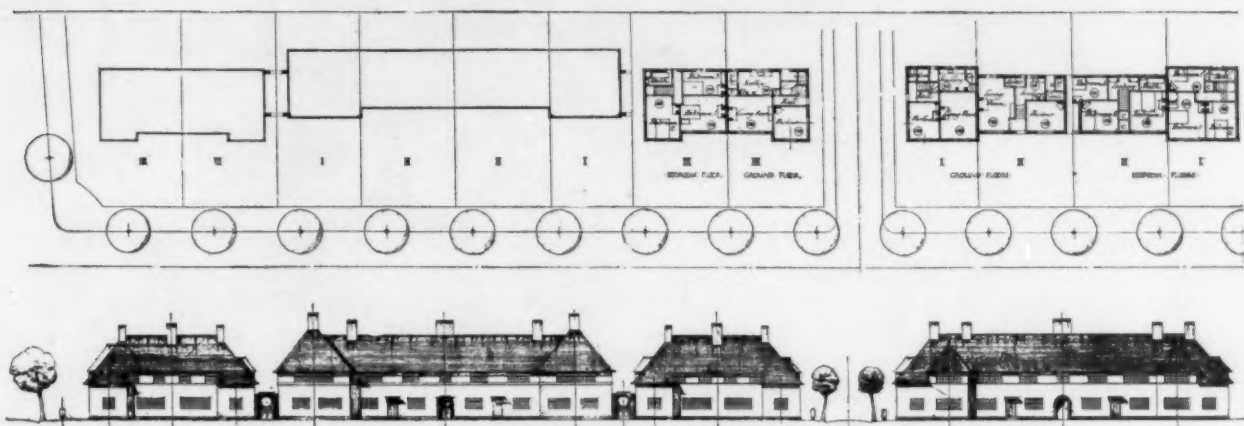
supply of electricity for house and street lighting and for cooking. Under the proposed system the waste heat produced in generating the electric current will not be dissipated, but will be turned to a practical use in providing the heating and constant hot-water supply to all the houses and other buildings on the estate.

The external design of the cottages illustrated has been dictated to a large extent by the fact that good facing bricks were not available in sufficiently large quantities or at a reasonable price. Fletton bricks and roughcast have had to be used, which almost compelled a more or less informal treatment. As soon as facing bricks of good surface and color



Block of Four Houses and Diagram of Location at Corners, Swanpool Village, Lincoln
Thompson, Hennell & James, Architects





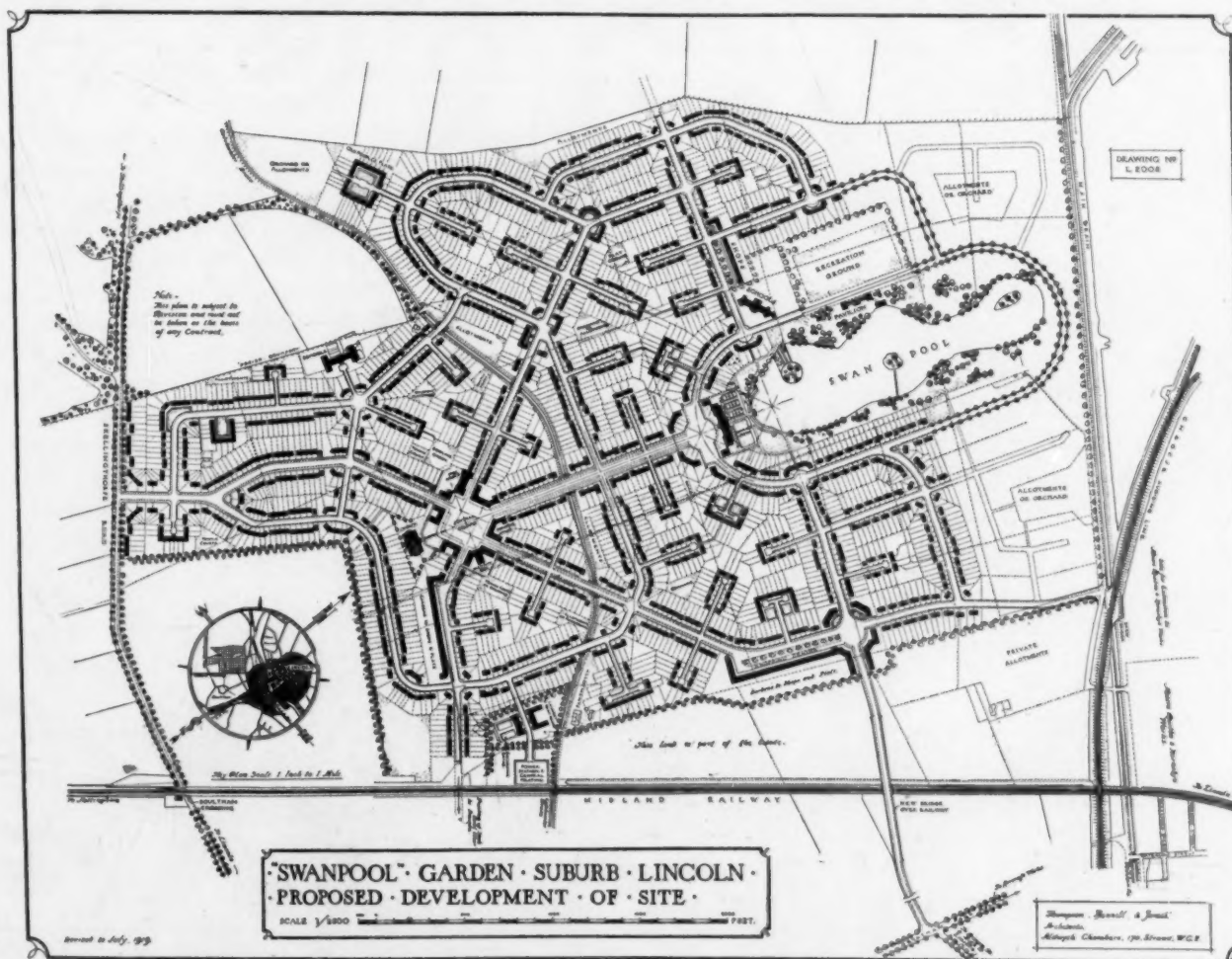
Elevations and Plans of Semi-Detached Houses, Swanpool Village, Lincoln

can be obtained, it is hoped to adopt a more formal Georgian treatment in some of the houses.

The Ministry of Health is anxious to encourage and preserve, as far as possible, the use of local traditions and materials, and a group of eight cottages at Newport in Wales, designed by Mr. Walter Rosser, M.S.A., shows a successful achievement in this direction. The cottages, which contain the usual accommodation of parlor, living room, scullery and bathroom on the ground

floor and three bedrooms on the first floor, are built of stone of mottled colors obtained locally and roofed with stone tiles; part of the walls are plastered externally, thus preserving a local tradition.

There are many indications that this, the first peace year, will be an extremely active one for the Royal Institute of British Architects, which is being infused with fresh vitality by its new and energetic president, Mr. John W. Simpson. The



Thompson, Hennell & Jones, Architects

opening of the new presidential year was marked by a very vigorous address at the first Council meeting of the session, in which the president boldly outlined a policy which embraced many delayed and vital reforms.

Among the more successful innovations of the Institute must be mentioned the formation of two consultative boards. One composed of architects, surveyors, contractors and members of the National Federation of Building Trade Operatives was formed for the purpose of establishing congenial relations, and a better understanding amongst persons whose interests are, appearances notwithstanding, far from inimical. The second board, known as the Central Consultative Board, exists for the purpose of placing local authorities and others who may be desirous of undertaking housing enterprises in touch with architects having the necessary qualifications.

The beneficial effects of this scheme are twofold: The local authority is supplied with the necessarily qualified person, and the young architect, having perhaps upon enlistment lost an incipient practice and being at a difficulty to recover it, is materially assisted. In cases where the scheme is a particularly large one, comprising some thousands of houses, an arrangement has been introduced whereby one or two architects of established reputation are appointed in a consultant capacity, dealing with a layout plan as a whole, and advising upon the site and its distribution; while the actual design of the houses is divided amongst a panel of younger executant architects, each of whom is responsible for some two hundred dwellings. Thus work is distributed and the possibility of monotony arising from the too frequent repetition of designs, all emanating from one mind, is

removed. A special scale of charges devised for work of this kind has been sanctioned and tabulated as follows:

	Layout per acre	Houses		Roads and Sewers assuming £900 per acre	
		Architect on gross value	Quantities on gross value	Design per acre	Quantities per acre
	£ s. d.	Per cent	Per cent		£ s. d.
12 Houses		5	2		
50 Houses		3.17	1.24		
100 Houses		2.52	1.05		
10 Acres	2 2 0			On a uniform rate of £45 per acre	20 10 0
120 Houses		2.35	1		
200 Houses		2	.9		
20 Acres	2 2 0				19 5 0
240 Houses		1.92	.87		
30 Acres	1 18 6				18 16 8
360 Houses		1.78	.83		
40 Acres	1 14 1				18 12 6
480 Houses		1.71	.81		
80 Acres	1 9 11				18 6 3
960 Houses		1.6	.78		
1,500 Houses		1.57	.77		
2,000 Houses		1.55			
3,000 Houses		1.53			
4,000 Houses		1.52	.76		
	and down to one guinea per acre minimum	and down to a 1.5 per cent minimum	and down to a .75 per cent minimum		and down to an £18 per acre minimum

The success with which the problems of the future will be faced, must depend in no little degree upon the education received by the student to-day, and in order that he may be the more adequately equipped, many drastic reforms are being considered, the general tendency of which is to broaden the outlook of the future architect. Hitherto he has maintained a position of glorious isolation from most other contemporary manifestations, which has led to the present disastrous position, which finds so many architects completely out of touch with the thoughts and aspirations both of their fellow-artists and of the people generally. The Architectural Association School, under the headmastership of Mr. Robert Atkinson, is making particular efforts to counteract this evil and is arranging students' courses in the subsidiary arts and crafts.



Cottages Near Newport, Wales, for the Ministry of Health
Walter Rosser, Architect

Meeting the Demand for Hotels in the Smaller Cities

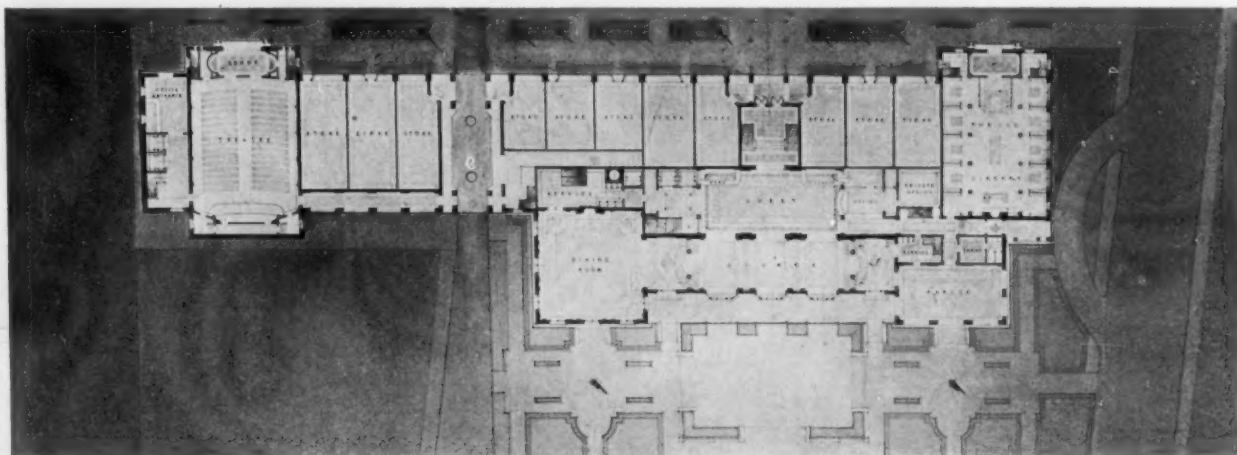
IN visiting the various smaller cities of the United States and Canada, particularly those which have been affected by an increase of industrial activity, there are three definite impressions which are usually made upon the mind of the average business man. These are : first, the need for additional and improved hotel accommodations ; second, the shortage of houses of every type ; and third, the need for additional commercial space for renting purposes. The first impression by contact is naturally that of a lack of hotel accommodations. In fact, it is safe to say that to-day there are not sufficient good hotel accommodations in any of our smaller cities which have undergone the pressure of rapid industrial growth.

In visiting city after city, particularly in the Middle West, one is impressed by the similar character of the old hotels which seem to be of practically the same vintage, all approximately equal in poor design and lack of efficiency, and usually having undergone foreclosure proceedings and forced reductions of capital investment which have reduced the actual investment to a point where hotels can be operated on at least a reasonable profit. Of course under present conditions practically any hotel is profitable. The better hotels in almost every city have invariably a waiting list, and travelers are forced to take accommodations in less attractive buildings. The popular hotels are accordingly paying high dividends.

The Trail of the Hotel Promoter

The trail of the hotel promoter of ten or fifteen years ago can be followed through a number of cities where ornate structures have been built by local capital raised through the efforts of the professional promoter. Investors of this type almost invariably suffer severe financial losses. This condition has been due to the fact that the average hotel of this type has been designed in an impractical manner with too much waste space, too great distances between production and service points, rooms which are too large, and other points of general inefficiency which, however, are of the utmost importance in their effect against the successful operation of the hotel. In such hotels too much money has been invested in ratio to the amount of paying space and, as a result, a large proportion of such investment has been lost through foreclosure proceedings and forced concessions on the part of the investors.

It is evident, therefore, that there is a direct relative factor between the amount of investment and the amount of paying space. If too much money is invested, this will be reduced through various agencies until a point has been reached when the investment will pay. Until that time the hotel does not operate on a successful basis. There are, of course, periods of fluctuation and increased business resulting from some unusual demand, but these do not constitute criterions of the financial success of the hotel, nor of its earning capacity.



An Interesting Plan of a Hotel Showing Elimination of Waste Space

Mann & MacNeille, Architects

In the above plan for a large tourist and commercial hotel the architects have cut to a minimum all non-paying space without sacrificing attractiveness of design. At the same time the utilization of this space for stores, theater and public library station creates an interesting center. Incidentally the City Club is located on the top floor of this hotel.

The only manner by which the value of a hotel investment may be successfully gauged is through the average earnings, discounting unusual conditions.

The General Hotel Shortage

To-day there exists a general hotel shortage such as has never been known before in the hotel business. This shortage is due to the following agencies:

1. Construction of new hotels not equal to city's growth.
2. Increased volume of travel, particularly by business men.
3. Industrial expansion involving general increasing of business in many cities.

The enforcement of national prohibition has, of course, been a decided blow to the business of existing hotels; but at the same time the passing of cafés and various other places of entertainment is bound to increase the popularity of hotel restaurants and other facilities for public amusement. The loss due to the cessation of liquor trade in hotels is being made up by slight increases of tariff on rooms and food, and by the establishment of lunch rooms and soft drink dispensaries.

There is a pressing demand for modern hotel accommodations in hundreds of our cities. The meeting of this demand by the design and construction of new hotels may be expected to bring about within the next few years the greatest investment in hotel projects that the country has ever known, and as more consideration is being given to the business aspect of such investment it may reasonably be expected that hotels may be more efficiently designed and constructed than ever before. Consequently, this field should prove of particular interest to the progressive architect.

Hotel Promotion as a Civic Activity

To such a point has the need of hotel accommodations been developed in the average industrial town and city that the provision of new hotels is being given serious consideration by those interested in civic betterment, particularly chambers of commerce, boards of trade and occasionally manufacturers' associations.

The value of a good local hotel is being constantly more clearly understood by the business interests of the city. There is no doubt that the existence of a good hotel brings considerable trade to local storekeepers, and in general creates a much better impression of the entire city in the minds of the public. The hotel reflects the spirit of the city in matters of progressiveness, and many factors of industrial expansion have been

traced to the existence of a good hotel which has induced recommendation of the city by traveling men, financiers, manufacturers and other business men who have spent some time in the city because of the fact that they could find good hotel accommodations there.

It is therefore evident that when the need for hotel accommodations becomes pressing this condition is quickly realized by the chamber of commerce or a similar centralized body of business men. The next step of the chamber of commerce is usually to investigate hotels as to their business aspects, methods of financing and other factors of interest in connection with such a project.

Methods of Financing

There are three ordinary methods of promoting a hotel of this type as follows:

- (a) Through the activities of a professional promoter;
- (b) Through the activities of a committee of the chamber of commerce or a similar organization;
- (c) Through the activities of interested individuals.

The efforts of the professional promoter must not be underestimated, for it is a fact that while in many cases hotels promoted in this manner have proven failures, there are many cases where cities have benefited considerably by the activities of these men.

The *modus operandi* of the average professional promoter after learning of the need for a hotel in any city is to visit the chamber of commerce and various influential citizens for the purpose of interesting them in the project. The promoter, as his first step, acquires an option on land forming a desirable location for the hotel, and has sketch plans prepared showing the type of building and its general layout. His next step is the organization of a holding company. In many cases he is well connected financially to the extent of being able to furnish first mortgage money to approximately 60 per cent of the valuation of the property, and it is the equity which he seeks to raise in the form of stock subscriptions. Often, too, he has already made arrangements with some firm of individuals who are ready to enter into contract to operate the hotel.

Having organized his holding corporation for a sufficient amount of stock to provide the necessary financing above the first mortgage, he attempts to sell his stock locally, usually selecting one or two influential citizens who if induced to buy may influence other investors. Unfortunately in many cases an attempt is made to do this through a gift of stock, but this practice is rapidly dying out. The promoter's services in many cases include not

only the sale of stock locally but the furnishing of designs and supervising the actual construction of the building, for all of which he gets a percentage of the entire cost of the operation, usually varying from 10 to 15 per cent.

The average hotel plans as worked out by the promoter are not good. He has not been able to retain the services of designers who really understand the operation of a hotel, owing to the fact that he is not in a position to pay for such services. His interest does not lie in the successful operation of the building, but is particularly directed to raising the money and seeing the construction carried out, at which point his activities cease.

The promotion of a hotel project through the activity of the chamber of commerce or similar organization is increasingly finding favor in our American cities. The method of the chamber of commerce involves: first, obtaining an option on a suitable site; second, obtaining agreements (usually through local financial institutions) to make a building and first mortgage loan up to approximately 60 per cent of the value of land and building, and finally to organize a holding company with sufficient capital stock to provide the necessary equity.

The chamber of commerce or a local committee in selling this stock usually works among those who may expect to gain indirectly from the existence of a good hotel. These naturally include owners of better stores—industrial corporations having local factories and others directly interested in civic betterment and municipal expansion. Usually it is found not difficult to raise the required funds, provided the plans for the hotel have been worked out along careful and logical lines, but it is at this point that many meet failure.

Where the raising of a large amount of money is found impossible through direct contact among those interested, chambers of commerce have been successful in putting on a sales campaign among the citizens to dispose of stock in smaller blocks. The slogan of such a campaign is invariably that of city betterment rather than extensive profits. There is no doubt that this is a less satisfactory manner of raising money as it is always found difficult to carry on the business of a local stock corporation where the stock is widely distributed, and it becomes necessary to give consideration to the viewpoints of many. Invariably the smaller a stock holding the more interest is taken by the stockholders, as it is usually found that the small stockholders are the principal obstructionists in any incorporated business, particularly if the holdings are in one community where neighborly interchange of opinion results in constant hectoring of the directors and complaints when stock is not

producing dividends after a very short period.

While the financing of hotels through popular subscription has been carried out in a number of instances it is interesting to realize that such hotels have for the most part resulted in failure, and the conclusion to be drawn is that this method of financing is but a last resort.

The first step after securing option on the land should be to have a good architect draw sketch plans of a hotel which will contain practical money-making features. Some details as to the business aspects will be considered in later paragraphs, but the point is that if the hotel is logically designed, it will be less difficult to obtain a lessee; and if the lessee can be provisionally obtained, the raising of necessary funds is made much easier.

The third method of promotion is the fostering of a hotel project by some individual who is to be directly interested. In some cases it is an architect who crystallizes public interest by working out a sketch plan on a logical location and stirring the chamber of commerce or other civic bodies into active efforts to materialize the plan. In other cases it is a builder or real estate broker, landowner, and sometimes an individual who has at heart the general interest of the city.

In all cases the methods of financing hotels of this character are similar and do not involve intricate detail. To demonstrate the lines along which financing such a project is generally carried out, the following paragraphs will describe in some detail how the necessary money was recently raised to build a hotel in a city of approximately 100,000 population. This city is located in the Middle West and is the center of a number of industries.

The hotel project was first taken up by a professional promoter who met with little success, owing to the fact that he had not much background of experience nor were the people of this city of a type easily impressed with his promotion methods. The work he did in the city, however, had the value of still further stressing to the public mind the need for a hotel; and after the promoter had given up the project it was revived by the chamber of commerce, which started out along logical lines to make the proposed hotel a reality.

Their first action was the formation of a hotel committee consisting of fifty representative business men, including bankers, real estate men, department store heads, industrial executives and men of similar type. This committee in turn elected an executive committee of three men, who were to report on various details. The executive committee obtained options on several tracts of land and at the first committee meeting final decision was made as to which tract of land was best for the purpose. This was done through the medium of

open discussion followed by an elimination ballot.

The next step was the formation of a holding company, and arrangements were made with local banks for financing up to 60 per cent. The tract of land selected cost \$80,000, \$40,000 of which the owner agreed to take as a second mortgage on the finished hotel, the remaining \$40,000 to be cash.

An architect who had had some experience in hotel design was selected to draw up sketch plans, and these plans were submitted to several hotel managers in other cities for criticism as to their service features. The sketch plans as drawn called for a million-dollar structure containing three hundred rooms, but the holding company wisely planned to build at first only one unit of this design containing one hundred rooms. The first unit of the hotel was built at a cost of approximately \$320,000, the construction being heavy enough to add several floors above, and there was contemplated also an additional wing.

The total cost of the operation, therefore, including land and building, came to \$400,000. On this amount a first mortgage of \$240,000 was taken by the local financial institutions. The owner of the land as per agreement took a second mortgage of \$40,000, and the necessary balance of \$120,000 was raised by the formation of a holding company capitalized at \$125,000 in shares of \$100 each of non-assessable common stock.

Arrangements had been made with a hotel manager in another city to take a long term lease on this building on the basis of 6 per cent of the value of the land and 8 per cent of the cost of the building, 2 per cent of this latter amount being placed in a sinking fund to insure reproduction value. In addition to this, all repairs, taxes and similar charges were to be at the expense of the lessee, with the exception of interest on the mortgages.

It is customary for the lessee of a hotel to provide the furnishings at his own cost, and a first lien on these furnishings is usually made a guaranty of the lease, providing that such furnishings shall accrue to the owners of the building in case of any default on the lease. The actual method of obtaining such protection is the issuance of a first mortgage against the furnishings in favor of the owner of the building, recorded and placed in escrow pending any default by the lessee.

The following tabulation will show approximately how the financing of this particular project was carried out and what the returns will be to the holding company. It must be realized that large direct returns cannot always be expected where a hotel is financed by those who expect indirect returns in the way of increased local business. It is on a basis of this nature that a hotel may be successfully promoted through civic enterprise.

Financial Tabulation of a Recent Hotel Project

Cost of land.....	\$80,000	
Cash.....	\$40,000	
Owner agrees to take second mortgage.....	40,000	
Cost of building.....	320,000	
COST OF ENTIRE OPERATION.....	\$400,000	
Building and first mortgage loan from local institutions at 5% for 5 years.....		\$240,000
Second mortgage accepted by owner in part payment for land at 6% for 5 years.....		40,000
Cash required from stock sales.....		120,000
		<u>\$400,000</u>
Holding company formed with capital stock (all common) 1,250 shares at \$100 par value providing cash.....		\$125,000
Cash required for equity in building cost.....	\$120,000	
Cost of obtaining first mortgage loan (charges 1½% to cover).....	3,600	
Cash left in treasury.....	1,400	

The terms of the lease involved an annual income to holding company as follows:

6% on \$80,000—cost of land	\$4,800
8% on 320,000—cost of building	25,600

GROSS ANNUAL INCOME \$30,400

The holding company should have practically no overhead expense. Therefore payments which must be made out of income are as follows:

Interest on first mortgage, \$240,000 at 5%.....	\$12,000
Interest on second mortgage, \$40,000 at 6%.....	2,400
Payment into sinking fund, 2% on Cost of building \$320,000.....	6,400
Annual legal and overhead expense (estimated necessary).....	500
Net income payable as dividends.....	<u>9,100</u>

The net income as shown above represents approximately 7 per cent of the total stock issue of \$125,000. It must be realized that this percentage can be obtained only by careful handling of the business of the company in keeping down its overhead expense. A holding company of this nature does not require a business organization, as practically all its business can be transacted through an attorney who will make necessary collections and payments. In addition to the amount shown as net income the holding company had set aside at the end of each year an amount of \$6,400 in the form of a sinking fund to offset the building depreciation or reproduction shrinkage. This amount is to be kept on hand (in an interest-bearing account) and is not to be divided among stockholders, but is to be used at the period of mortgage termination for the purpose of mortgage reduction. Naturally if at the end of the mortgage period, which in this case is five years on both first and second mortgages, the mortgagees are willing to make a further extension of a period of years without reduction of principal, the sinking fund can be divided as an extra dividend.

At the end of a five-year period of the tabulation given above there will be on hand in the sinking fund approximately \$32,000 and interest. Of this

amount it is planned to use \$10,000 to reduce the second mortgage principal and \$20,000 to reduce the first mortgage principal. The earnings of the stock during the next five years would then be :

Gross annual income	\$30,400
Interest on first mortgage \$220,000 at 5%	11,000
Interest on second mortgage \$30,000 at 6%	1,800
Payment into sinking fund 2% on cost of building \$320,000	6,400
Annual legal and overhead expense (estimated necessary)	500
NET INCOME	10,700

The above net income during the second period of five years represents a return of $8\frac{1}{2}$ per cent on stock issued to the amount of \$125,000.

From this point on mortgages will probably be no longer reduced and sinking fund can be periodically divided among stockholders.

From the first tabulation of this hotel project it will be seen that the following constitutes the percentage to stockholders :

Net income as shown in first tabulation	\$9,100
Payment into sinking fund	6,400
Total annual net profit	\$15,500
or 12.4% on the investment of \$125,000.	

NOTE. To this amount may be added accrued interest on deposit of sinking fund money.

The figures given in the above operation are those of an actual lease consummated in a town where there existed considerable demand for a hotel. The percentages paid on land and building are liberal, and higher than in larger cities where they usually run 5 per cent on land and 6 per cent on buildings. Under normally good conditions, however, the rental as shown above for a hotel of that type is not excessive and the operating company can expect to make a large percentage.

Another method of financing hotels which requires less money to be raised originally is the amortization type of hotel mortgage which has been worked out by two or three loaning institutions which operate nationally.

In general, this method of financing involves the obtaining of a building and mortgage loan approximating about 80 per cent of the value of the land and building, making it necessary to raise only 20 per cent of the cost of the operation locally. This mortgage is reduced periodically by payments against the principal as well as the interest, and in some instances a regular monthly payment is worked out in the form of an amortization table which over a period of approximately ten years will reduce the mortgage until it comes within a banking percentage, at the same time paying interest. Quite often the rental paid by the lessee is applied directly to this amortization payment.

Another obvious method of financing is to pay the landowner a good price for his land and to arrange with him to take this payment in the form of stock in the holding company. It is then pos-

sible to obtain a construction and permanent loan almost sufficient to pay the cost of construction, and the necessary balance is raised by stock subscription.

In leasing a hotel the most popular method at present is that of payment of the lessee of a percentage on land and the building investment, together with all taxes and improvements. In very large city hotels, such as the Pennsylvania and Commodore in New York City, the lessee pays 5 per cent on land and 6 per cent on the building. In the small hotels, particularly those where the holding company counts on a fair percentage on the investment, the lessee pays as outlined above, 6 per cent on land and 8 per cent on the building. Of the 8 per cent on building, 2 per cent is placed aside in a sinking fund to bring about a gradual reduction of the building investment so that in case the cost of material and labor may fall in coming years, the investment on the building has been reduced at the rate of 2 per cent a year to a point where the investment will not suffer by depreciation or reproduction values. This is a factor which should be given serious consideration at this time of high production cost.

Selecting a Site for the Hotel

The selection of a site for a hotel in any of our smaller cities has many important business aspects, both from the viewpoint of civic benefit and from the individual viewpoint of hotel owner and lessee. It is no longer thought necessary to have a hotel located at a railroad station. In fact, it is more attractive for tenants of the building to be in a quieter section. It is usually conceded by authorities that in smaller cities hotels should be within comparatively easy walking distance of the railroad station wherever possible.

In locating a hotel from a civic viewpoint it must be realized that a building of this nature may be so located that it will tend to encourage the extension of the business center and perhaps to set the pace for high class business development in a section of the city which heretofore has been backward. This condition may be plainly seen in the placing of various recently constructed hotels.

It is found that the location of a hotel usually causes a rapid increase in realty values in surrounding land. Of this point, advantage is often taken in promoting hotel projects by agreeing to the location of a hotel in accordance with stock subscriptions of owners of land which will be benefited.

The site of a new hotel should be fairly central in its relation to stores, theaters and other community facilities, and if possible should be given the benefit of open parking space.

Why Many Hotels Have Failed

In the course of an interesting discussion with a hotel man who has had wide experience in the management, sale and leasing of hotels of all types throughout the United States and Canada, it was interesting to learn that the average hotel failure has not been ascribed to lack of business or dulness of local conditions. In many instances such conditions are blamed for hotel failure by shortsighted managers, when, as a matter of fact, if a hotel has been properly designed and managed, it would have proven a paying venture on the gross annual income which had been realized.

It is true that hotels which have failed might have paid if they had been filled at all times, and that they were not filled is due to local business conditions not warranting such occupancy; but the experienced hotel man usually ascribes failure to other causes.

Probably the most important cause of failures among hotels is that of impracticable design involving too much waste space. One has but to recall the average old hotel to realize the great spaces which were given over to lounges and similar public space; unused dining rooms, over-wide corridors, and similar waste space which, however, represented a considerable percentage of the necessary investment. As a result such hotels were forced to pay the overhead and interest on this wasted investment, and this has resulted in failure in business, when the same volume of business in a hotel of practical design, with a much lower ratio of non-paying space, would have paid well on the smaller investment required. (In a future article in this department by one of America's leading hotel experts this question of waste space in hotel design will be given consideration from the business viewpoint.)

There are, of course, many sources of income which may be instituted in the average hotel, but for the most part these are included in the lease and are operated by the lessee. In the design of the average hotel, however, it is quite possible to include a number of stores in the building which may be retained by the holding company for rental purposes. Depending on the location, these stores may at times prove sources of considerable additional income, and with show windows opening in the lobby of the hotel they often constitute a valuable and attractive feature of service to guests.

Making the First Period Easier for the Lessee

It is of course understood that the first two or three years in the development of business in a new hotel are usually the hardest years from the financial viewpoint of the lessee, and as this fact

is generally recognized some provision is usually made in leases to graduate rental cost in fair ratio to the expected income of the business.

There are several methods through which this plan is carried out, and it might be well to cite the method used in the lease of the Pennsylvania Hotel to the New York Hotel Statler Company. This lease was made to run for twenty-one years after the completion of the building and calls for payment of ground rent of 5 per cent a year plus taxes and other charges. In addition the lessee pays an annual rental of 6 per cent of the cost of construction of the building less a deduction of definite and decreasing amounts each year for three years. During the balance of the term of the lease, or a period of eighteen years, the lessee is to pay the total rent as determined by percentages on ground and building costs and in addition is to pay annually one-eighteenth of the sum deducted in the first three years.

Applying this policy to the hotel project tabulated in previous paragraphs, we find the lessee paying annually 8 per cent on a building cost of \$320,000, or a sum of \$25,600. In making this lease this payment was reduced by \$7,600 the first year; \$5,600 the second year, and \$3,600 the third year. In other words, the actual rental to be paid over a period of twenty-one years is \$18,000 for the first year; \$20,000 for the second year; \$22,000 for the third year, and after that at the rental of \$25,600 a year plus one-eighteenth of the total of the previous deductions (\$16,800), making an additional payment of approximately \$930 per year, or an annual payment over the eighteen year period of \$26,530.

Another means which has been used successfully to give definite civic encouragement to a hotel project is the policy of tax exemption. It is apparent that the direct benefit which the small city may expect from a hotel should make such encouragement logical and the usual period for which tax exemption is granted is for ten years. As much of the success of a hotel depends upon the business ability and enthusiasm of the lessee who operates the business, it is evident that if he is relieved of the additional burden of taxes, his profits will be consequently greater and his interest equally stimulated.

In many hotels in smaller cities it has been found convenient to locate a city club in the hotel. Experience has shown that this action is mutually beneficial, as it provides a definite annual rental income for the lessee, as well as any restaurant and general business which may emanate from the club. In this matter the hotel is made somewhat of a business center—a condition which is thoroughly impressive in its effect on visitors.

Competition for a Small Face Brick House

REPORT OF THE JURY OF AWARD

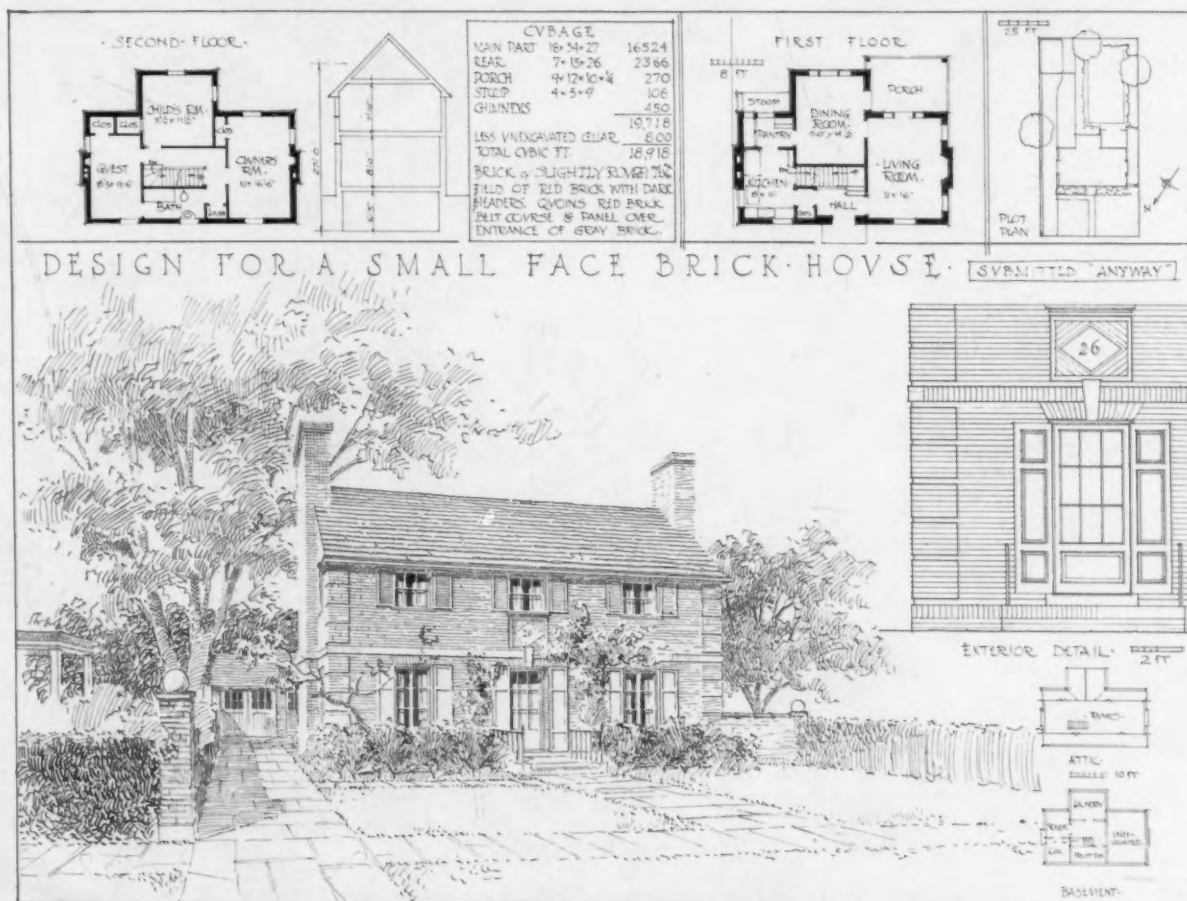
THERE were submitted in this competition 366 designs, an unusually large number, and indicative of the fact that architects and draftsmen are out of uniform and back on their jobs. While there were no designs submitted of such conspicuous and outstanding merit in either design or rendering as we have seen in previous competitions, the drawings were as a whole remarkable for two things: First, for the uniformly high standard of them all, which made it extremely difficult to select ten designs to be premiated; and second, because there were absolutely no drawings submitted which showed so little knowledge of architecture as to be ludicrous.

It was also a pleasure to find that the competitors had on the whole considered the spirit as well as the letter of the program, and had designed houses (as they have to be designed for clients) with one eye on the cost as well as one on the design of a picturesque building. We all know that since this program was written prices have so advanced that it is no longer possible to build a brick house, or indeed a house of any kind, for 35 cents a cubic foot in most parts of the country; but the obvious intent was that it should be economically designed within 20,000 cubic feet.

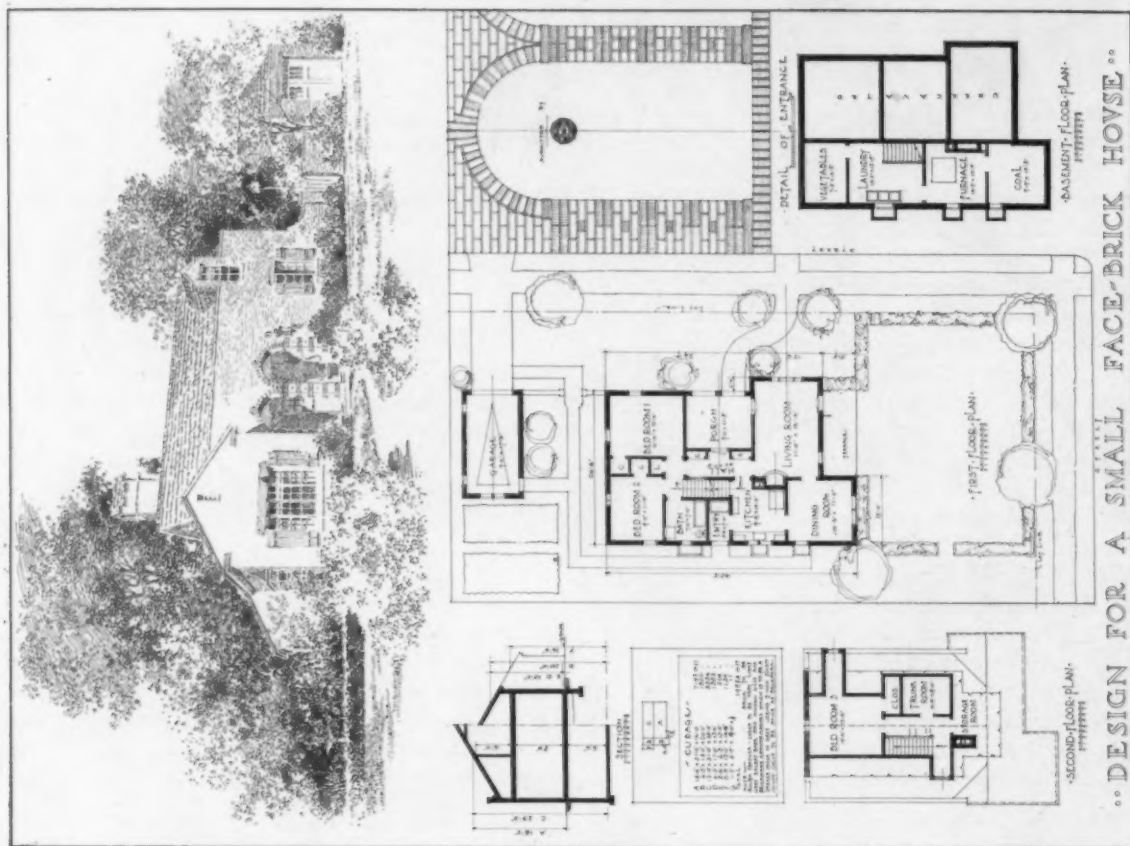
The standard of pen rendering in the United States has enormously advanced since the first *Brickbuilder* competition some ten years ago. The jurors were desired to select forty houses, in addition to the premiated designs, for publication in book form, and while in this competition one could have selected a hundred and fifty which were well rendered and of meritorious design, in the earlier competitions it would have been difficult to have found twenty. However, in many of the designs submitted, the rendering was overworked so as to confuse the drawings, and in endeavoring to produce drawings with a "punch" too much black was used without proper regard for spotting it to produce a pictorial effect.

The jury found a great number of designs on an "L" shaped plan with the ridges at the same height. This unavoidably results in a confusion as to what is the principal mass and what the appendage, and this type of house is too small for a group of masses, but must be treated as a single mass with appendages. Also there was a tendency to vary unduly the roof pitches in a way to lead to unpleasant results, as well as to make difficult construction.

The program called obviously for a house which

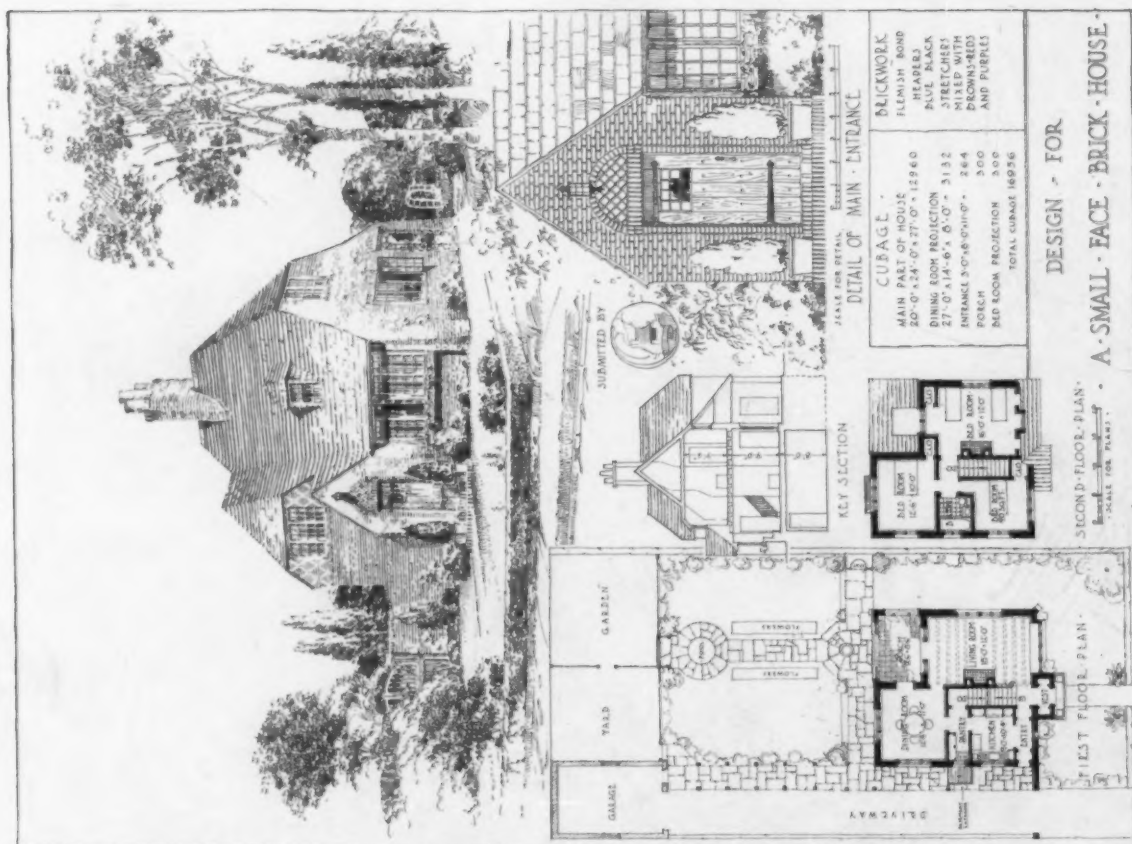


FIRST PRIZE DESIGN
SUBMITTED BY OLAF WILLIAM SHELIGREN, BUFFALO, N. Y.



THIRD PRIZE DESIGN

SUBMITTED BY E. J. MAIER, T. E. KING AND G. H. ERARD, TOLEDO, O.



SECOND PRIZE DESIGN

SUBMITTED BY J. FLOYD YEWELL, NEW YORK, N. Y.

could be run without servants, and great economy of space was therefore requisite. The kitchen should be made compact and convenient—as purely a working space. The main staircase then should be accessible from the kitchen as well as from the living room, and while the foot of the staircase might be near the entrance doorway, there is no reason why it should not ascend from a part of the house remote from the entrance. The dominant rooms should be the living room on the first story and the owner's bedroom on the second, and no space should be wasted in an attempt to make an impressive hall.

Further, while an interior lot was not definitely prescribed, as there are ten interior lots to every corner lot on which houses of this size are built, the jury gave preference to the competitors (the vast majority) who took the more difficult problem of the interior lot. On the whole, also, the jury preferred those designs which placed the living rooms of the house to the rear facing a garden, believing that the average American suburban community places too much stress in facing the street; but the disposition of main rooms would normally follow the sun, air and outlook—conditions not predicated in the program, but which would be assumed by the competitors, so that designs with the principal rooms or piazza facing the street were not regarded with disfavor.

FIRST PRIZE DESIGN. This design combines practically all the features that the jury felt to be necessary to a correct solution of the problem. The architecture is of an extreme simplicity, but very great charm, and admirably adapted to secure a maximum decorative effect with a minimum of expense. The design depends only upon the fenestration, the excellence of the mass, and the good quality of the detail. The placing of the house upon the property is good, and the treatment of the back garden simple, but entirely satisfactory. While the plan presents no extraordinary feature, there is no waste space and the rooms are of good size, properly proportioned each to the other and well located. The porch connects the living and dining rooms, so that it may be used either as a living porch or an outside dining room. The kitchen is compact and is connected to the dining room by a pantry, which while small is entirely ade-

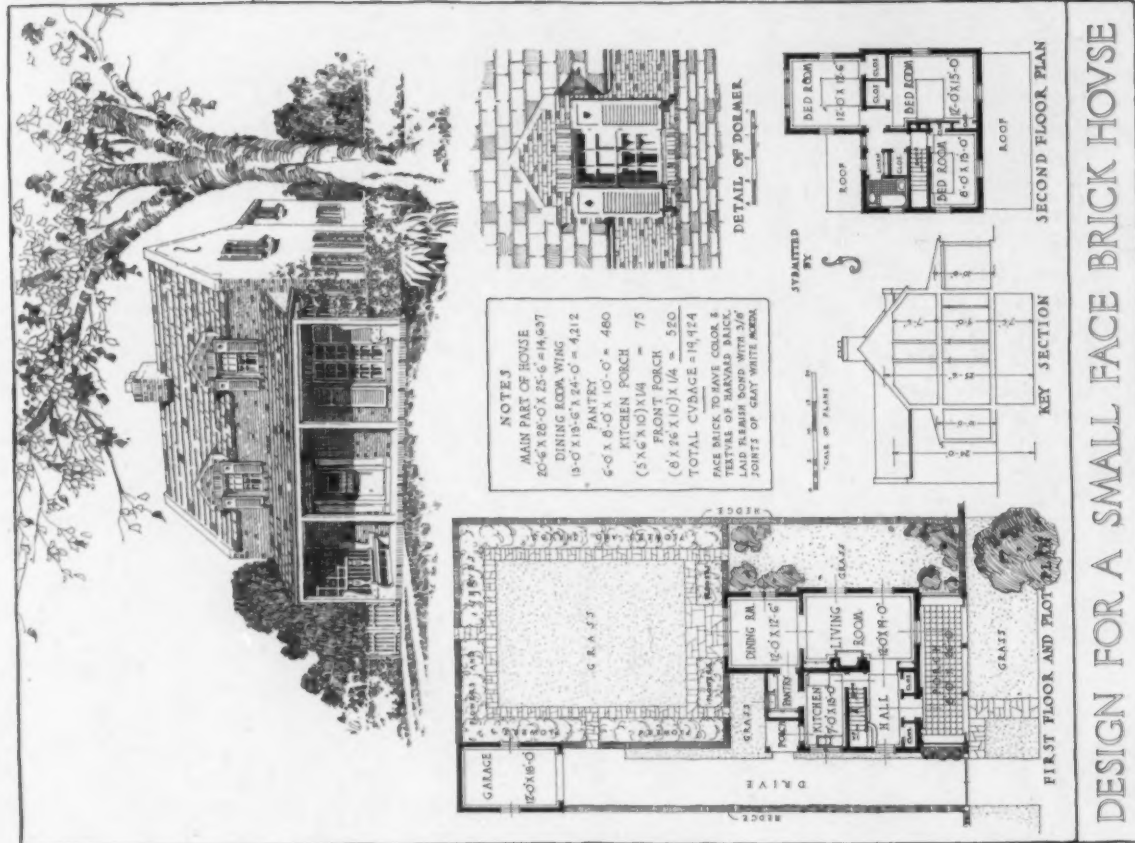
quate, since in a house of this size the pantry would be used only as a china closet without an extra sink, but its inclusion as an intermediate feature between the kitchen and the dining room is necessary to cut off odors from the kitchen. The bedrooms are all square and free from projecting closets or unpleasant angles. The scheme as a whole is a practical and artistic solution of a just conception of the problem.

SECOND PRIZE DESIGN. Much the same considerations which determined the choice of the first prize influenced the jury in selecting this house for the second prize, although Mr. Shelgren's design indicated a formal little house, while this design tends toward the picturesque. It is quite the best of the picturesque houses submitted, growing up as it does in each direction from the ground, and depending for its picturesque quality upon the admirable placing of the entrance, the gables and the windows, and upon the simple and natural treatment of the brickwork. There is no addition of unnecessary features, or contortion



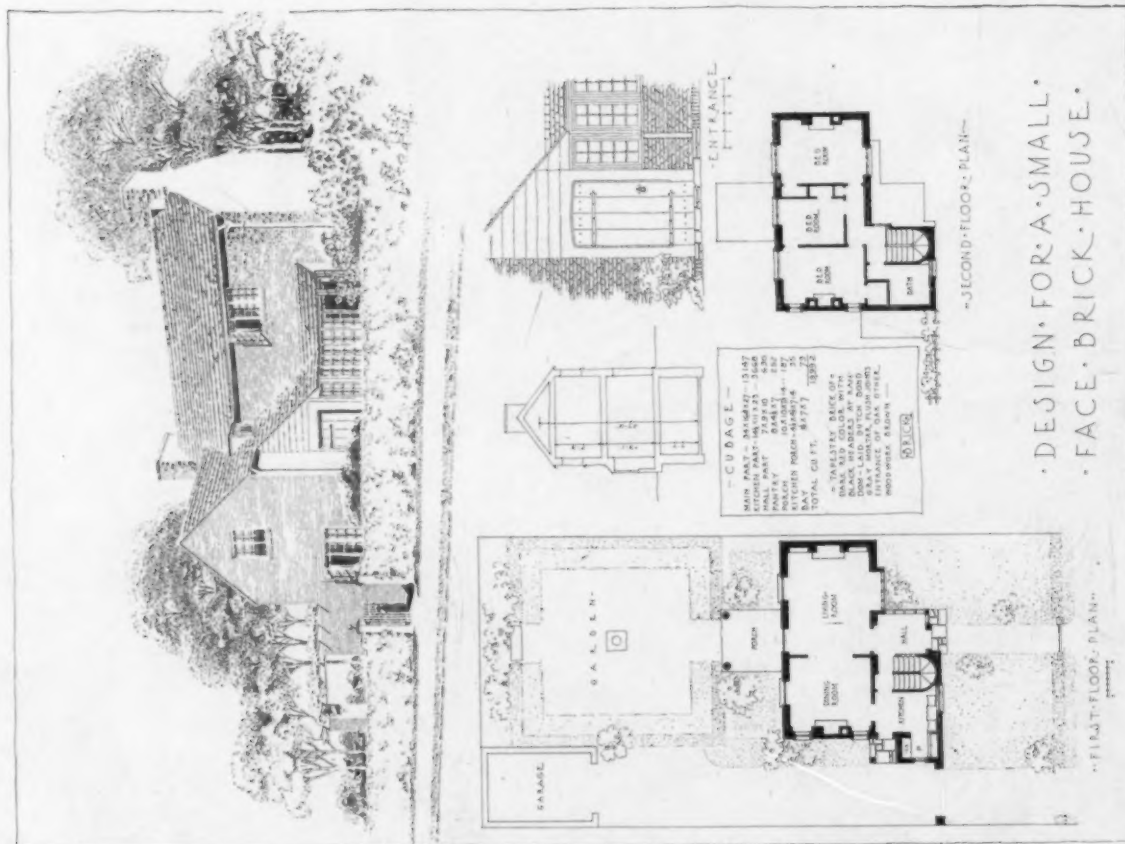
FOURTH PRIZE DESIGN

SUBMITTED BY HALSEY B. HORNER, BOSTON, MASS.



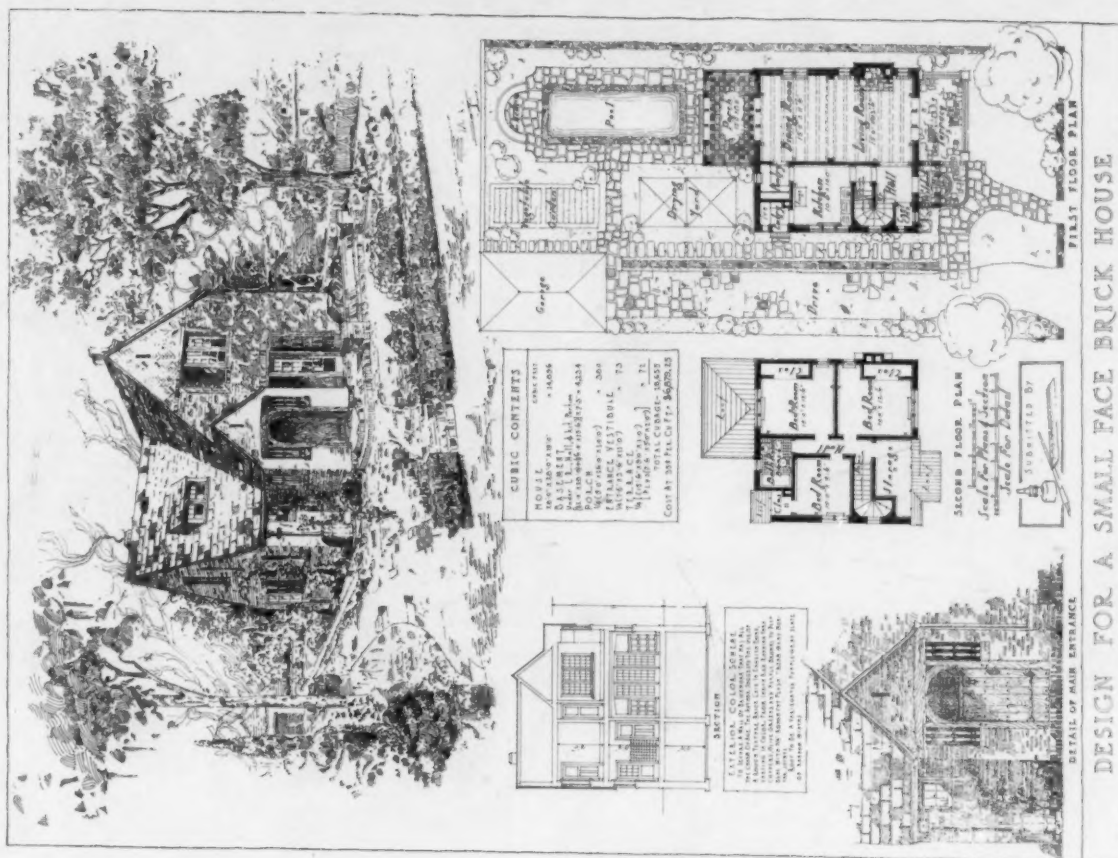
MENTION DESIGN

SUBMITTED BY J. IVAN DISE, DETROIT, MICH.



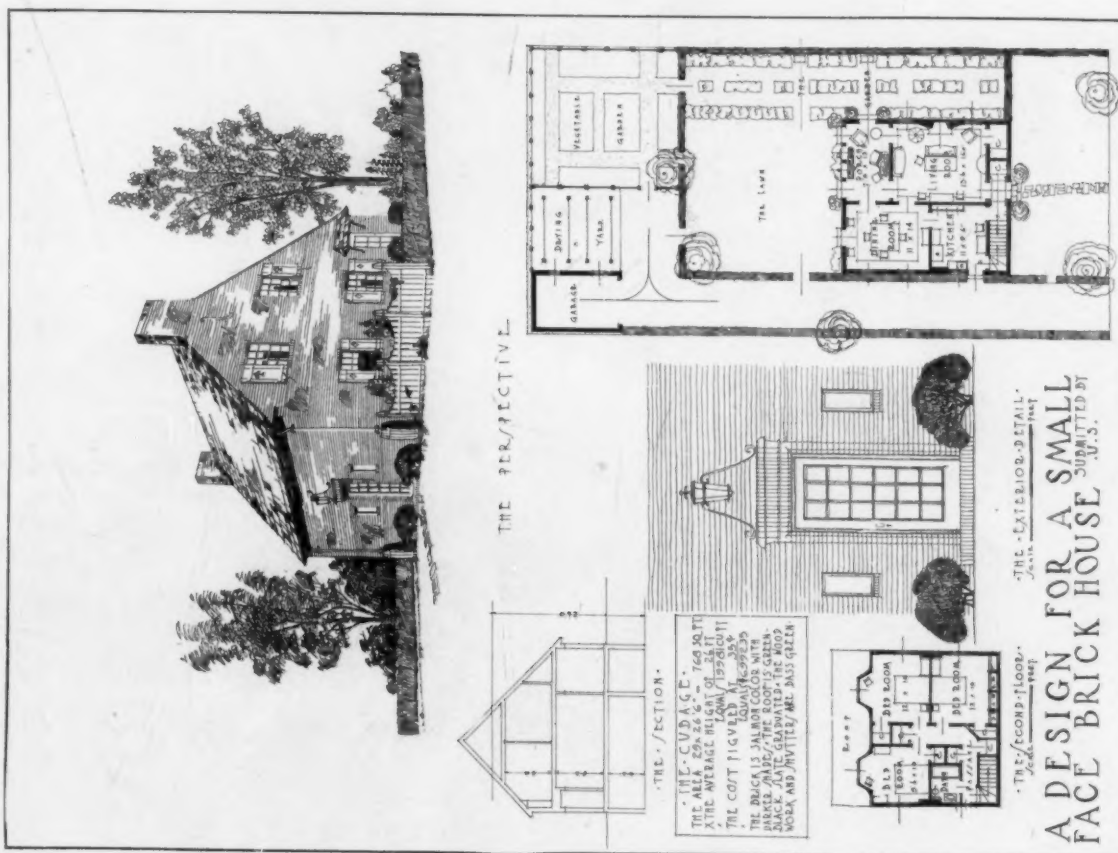
MENTION DESIGN

SUBMITTED BY A. S. CRAPSEY, NEW YORK, N. Y.



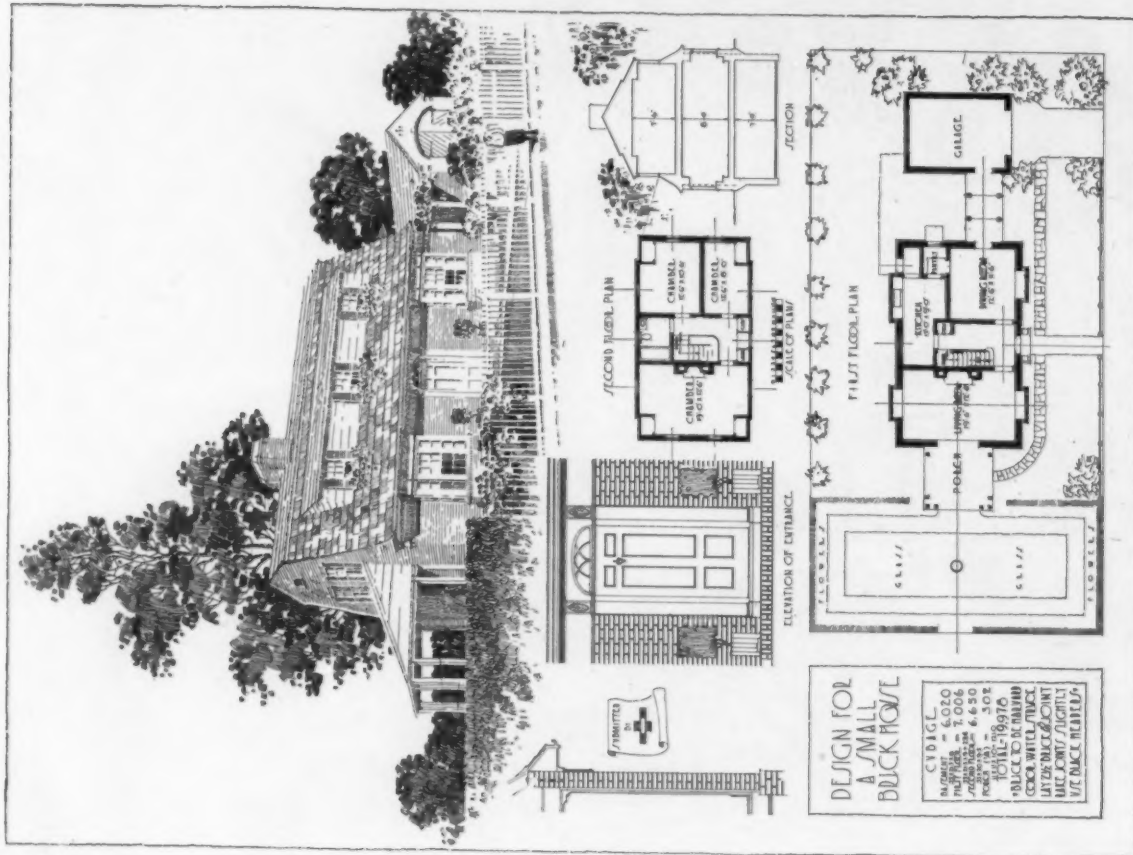
MENTION DESIGN

SUBMITTED BY ALBERT M. AND CHARLES F. PYKE, INDIANAPOLIS, IND.

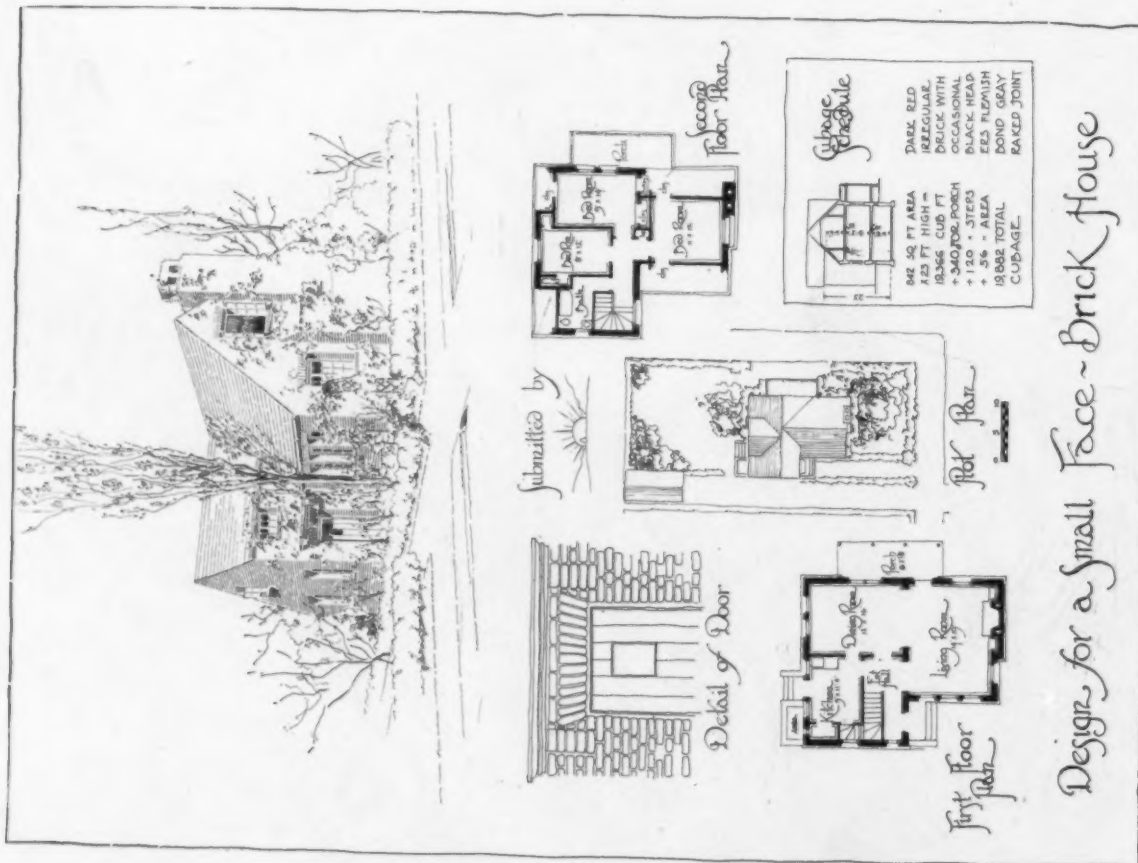


MENTION DESIGN

SUBMITTED BY GEORGE H. VAN ANDA, NEW YORK, N. Y.



MENTION DESIGN
SUBMITTED BY JOHN BARNARD, BOSTON, MASS.



MENTION DESIGN
SUBMITTED BY ERNEST E. WEIHE, SAN FRANCISCO, CALIF.

of motives to secure the picturesque at the expense of practicality of plan, or simplicity of construction, and each of the motives, which commend themselves as attractive on the exterior, is a signified expression of some feature equally attractive upon the interior. The jurors felt that the staircase was rather thrust upon the person entering the house, although the vestibule mitigates to some extent the objection. The service entry and the pantry were thought to be commendable features. While the main bedroom has the ends cut off by the slope of the roof, the dormers are placed on center of the principal axes and the waste spaces taken up by closets, so that the room will be both practical and attractive. The bathroom is well placed over the pantry and the plan is perhaps the most compact of all those submitted.

THIRD PRIZE DESIGN. This design might very well have been placed higher than third, except for two things: First, the designers have chosen a corner lot, reducing the difficulty of their problem; and second, because the designers seemed to be uncertain in their own minds as to whether they were or were not designing a bungalow, and finally compromised by placing one bedroom in the second story, badly lighted and far from the bathroom—a decided inconvenience. The first story is excellently planned except for the tour of the grounds, which is necessary from the street to the service entrance, for which some much better solution might be obtained. The arrangement of the living room, dining room and kitchen is good, and the bedrooms form a group completely separated from the living part of the house,—and no space has been lost in halls leading to them. The exterior was, perhaps, the most interesting of the entire competition, but the above mentioned defects forced the jury to rank the design no higher.

FOURTH PRIZE DESIGN. This was quite the best of the very great number of "L" shaped plans submitted. The placing of the chimney assists to relieve the unpleasant appearance of ridge lines at approximately the same height. The exterior is very picturesque and the plan of the first floor is extremely practical and compact. The second story suffers somewhat from the loss of space inherent in the adoption of low eave lines and steep pitch roofs, but this on the whole has been well taken care of. A better disposition of the closet space in the second story might easily have been made. The drawing suffers in appearance from overrendering of both the plan and perspective. Compare this, for example, with the simplicity of rendering of the first and third prize designs.

MENTION DESIGNS.

The design submitted by George H. Van Anda was given mention chiefly on the exterior, which the jury felt to be unusually satisfactory as a simple and interesting mass. However, the plan was considerably forced to secure the unbroken façade of the street front, and while the first and second floor plans were by no means bad, a considerable amount of study would be necessary to clear up the cluttered hall on the second story and to improve the unpleasant stairs.

The design by Albert M. and Charles F. Pyke is well planned, the jury liking the idea of making the living room and dining room practically as one, and finding the arrangement of stairs between hall and kitchen especially good. The bedrooms on the second floor are also well arranged. The jury did not like the method of roofing the "L" shaped plan, believing that though not bad from the point of view chosen, it would result in an unpleasing exterior from many points of view; but the details of the entrance porch were so good the jury was inclined to believe that the final result would be somewhat redeemed by skill in handling other parts of the building, although they were unable to commend the exterior as a whole.

In the design submitted by A. S. Crapsey the arrangement of the house upon the property was thought to be most excellent in the placing of the living room and dining room across the rear. The living room is planned well and practical. The combination of drive and service entrance is also excellent, and the placing of the stairs especially to be commended. The second floor plan is good and the exterior entirely charming.

The jury was especially pleased with the exterior of the design submitted by J. Ivan Dise. It was one of the few with the porch across the front and, although the architecture is reduced to the simplest possible measure, still the design is sufficiently picturesque. The plan of both the first and second story is attractive, although more space is wasted in the hall than was absolutely requisite, and if the rear of the lot was intended for a garden, it would seem rather a pity not to have the living room receive the advantage of facing this feature.

In the design by Ernest E. Weihe the contestant in common with many of the other competitors failed to make up his mind as to which was the principal roof and which the wing. The plan of the first floor is attractive in its simplicity and the plan of the second story is fair. Lack of effort of the rendering of both plans and perspective was commended by the jury.

In the design submitted by John Barnard the lot was assumed to be a corner one, and thereby the contestant gave himself an advantage over most of the other competitors, which he failed to utilize to the highest degree. The design was the best of a considerable number of gambrel roofed houses submitted, although in order to secure sufficient height in the second story bedrooms the designer thought it necessary to introduce long shed dormers in both the front and back of the roof, thereby injuring to some extent the simplicity of roof, which is the charm of the Dutch Colonial house, and resulting in unusable spaces in the corners of all second story rooms. The plan otherwise is good and the exterior shows good taste in matters of detail.

H. LOUIS DUHRING, JR., Philadelphia,
 AYMAR EMBURY II, New York,
 C. HERRICK HAMMOND, Chicago,
 WALTER H. KILHAM, Boston,
 LOUIS LA BEAUME, St. Louis,

Jury of Award.

EDITORIAL COMMENT

THE PUBLIC APPRECIATION OF ARCHITECTURE

AT the last convention of the American Institute of Architects in April of this year the remark was made by a speaker that no larger or more important task awaited the efforts of the Institute than the matter of public education in the appreciation of the fine arts, and architecture in particular. The resolution that occasioned the remark recommended close co-operation of the Institute's Committee on Education with the Association of American Colleges, and a very interesting discussion centered about it. It was pointed out that our universities had one serious shortcoming from a cultural aspect in that they did not at any point recognize the fine arts, or that the existence and appreciation of the fine arts connotes the highest state of civilization. As a natural consequence, in later years when their graduates take an influential part in affairs of public interest, they are able to bring to their duties no real conception or appreciation of the artist's work.

We are daily reminded of the existence of this barrier to the progress of architecture. There is instinctively an appeal to almost every human in an imposing and handsome building—he may stop to admire it, but very few have any appreciation of the fact that it required some artist to design it. The man is a hundred times more likely to visualize the work of the contractor who erected it, and mentally give him credit for a piece of work well done, than to think of the greater work of the designer. Why is this so? Because we can only appreciate those things about which we have some knowledge. The man in the street has seen the foundations put in place, he has watched the steel framework riveted together, he has observed the building take definite shape through the work of the stone mason. These things he knows; and knowing them, not from a technical standpoint but only in a general sense, he appreciates them. On the other hand, he may not even number among his acquaintances an architect, to say nothing of having any familiarity with an architect's office where he might observe the talent and industry expended in the preparation of drawings for the buildings he sees all around him. Furthermore, he never will know the function of the architect or be able to appreciate the art of architecture until architects realize that they owe an important duty to their profession, and a bigger one to civilization, in taking definite steps to bring to the public some knowledge of their art.

In the exercises attending the dedication of the memorial to John Mervin Carrère, which is illus-

trated on another page of this issue, Mr. Joseph H. Freedlander stated that with the exception of the monument to Richard M. Hunt in New York, this is the only memorial to an architect ever erected in this country. Could more convincing evidence be asked of the lack of public appreciation of architecture and of the men who have brought it to the present high state of development in this country? No other profession has made greater progress in the last half century, nor is the work of any other more intimately under observation, yet appreciation of architecture is practically limited to its own followers.

But what a group of illustrious names does the architectural profession revere! — Richardson, Burnham, Hunt, McKim, Carrère, Day and many others. What does the greatness of our cities not owe these men? Yet their names are known to but few outside the profession. Is not the work they have done in providing us with the inspiration to achieve better civic development, and more wholesome and beautiful surroundings for all citizens, of sufficient value to rank with the work of leaders in the fields of medicine, law and the church? It is an indication of the lack of breadth in our cultural training that the work these men accomplished remains as a sealed book, and the memory of their names confined to their confrères, when the world would be eager to share in giving them honor if their worth were known.

The whole effect of the true architect's work is influencing the public unconsciously to require better buildings and surroundings for their daily lives. The practice of architecture is one of the most constructive callings in the world, and there is in it elements that would strike a responsive chord in the public mind. The art of architecture, the high ideals that govern its practice, its essentialness to the full cultural development of a nation, must be made known to the public. It is, as the speaker at the convention remarked, the biggest task before the Institute. The people are entitled to share in the knowledge of architecture with the profession, and it is the unescapable duty of architects through the Institute, their representative body, to co-operate with all educational agencies to the end that a spirit of appreciation for the fine arts may be fostered, thereby assuring to future generations a greater opportunity to enjoy the things of the spirit, and to the leaders in the greatest of all arts a larger measure of public recognition than is represented by two monuments commemorating so important a public work in this country as the architectural activities of over half a century.